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Value of State-Room Space

The action of the railroads in doubling the fare to be asked of a passenger who has a stateroom all to himself elicits varying comments. One well-meaning newspaper, finding no element of injustice to complain of, remarks that this is the railroads' way of taking revenge on the public for having forced a reduction in the prices of upper berths—forgetting that that reduction in the Pullman Company's rates had no effect on the railroads either way, unless it was to benefit them by increasing the number of passengers. And the present change is of no particular benefit to the Pullman Company. Another critic says that the railroads will not find the change profitable; but if that is the case they can rescind their order. Even the Interstate Commerce Commission would permit that, no doubt. A typical comment is that of the New York *Times*, which says: "So far as the increase in rates tends to crowd still more the disgracefully public and inconvenient upper and lower berth cars, it will operate as a nuisance. It is a step in just the wrong direction. Our American sleeping cars are a flagrant exception to the rule that we do things better here than they are done abroad. The spirit of progress demands that we exchange the discomforts and indecencies of the berth and section for the privacy and convenience of the compartment. The increase in charges for drawing rooms is a reactionary step."

Behavior of Passengers in Sleeping Cars

"Spirit of progress" is a fine phrase; and the demands of that spirit must be listened to; but this spirit is the thing which has demanded so much that everybody is complaining of the high cost of living; and the spirit of economy is now clamoring to be heard. One reason for the high cost of satisfying legitimate needs is that so much has been spent on those that were imaginary or wasteful. It would seem eminently fair for the carrier, as well as for the Pullman Company, to charge passengers in proportion to the space that they occupy. As for discomforts, the great majority of sleeping car passengers put up with them because of the very high cost—high legitimate cost—of the space in a car which is worth, say, $30 per square foot of floor, and to haul which costs perhaps five to ten dollars per passenger for each 300 miles—a short night's ride. In other words, if sleeping cars were so constructed as to afford the ideal privacy the cost would be too high for the purses of all but a very small proportion of travelers. The indecencies encountered in sleeping cars are really very rare. The courtesy of American travelers towards each other in sleeping cars has, indeed, been characterized by discerning critics as peculiarly admirable. The occasional boor, although it is true he is to be found, is no more frequent than in other surroundings. It is perhaps quite likely that a careful comparison would show him to be less frequent; but his rude and offensive behavior is more conspicuous because in the sleeping cars we are compelled to measure his conduct by so high a standard.

Progress in Signal Glasses

The subject before the New York Railroad Club at its meeting last week was "Signal Glass" with a paper by Dr. William Churchill of the Corning Glass Works. The meeting brought out two significant facts which may be far-reaching. One is that yellow as a night signal color is a success. It may be said that this was proved long ago; but what we mean is that by recent improvements in the tint of yellow glass the most reluctant are being convinced. The biggest objection to changing from white to green for the night clear indication has, hitherto, been the cost; soon all will have to admit that yellow is so satisfactory for the distant indication that cost is the only objection. The other fact is that light signals are finding increasing favor for daylight signaling. That is to say, the successful use of lights instead of semaphores at places such as the Pennsylvania station in New York City, where speeds are low, is leading conservative signal engineers to consider them for high speed signaling. It cannot yet be said that the costly and sometimes troublesome semaphore is doomed, for, as Dr. Churchill says, extensive experimentation will be needed to determine the most suitable size of lens and intensity of color to meet the many varied conditions of sunny and cloudy days. Progress, nevertheless is being made.

WHEN DOCTORS DISAGREE

IT is frequently interesting to observe the varying ways in which statistics are used in public by those whose purpose is agitation and by those whose utterances are tempered by long experience and a sense of responsibility. Clifford Thorne, chairman of the Iowa railroad commission, has recently obtained widespread publicity for a combination of figures indicating that the railways of the United States could be purchased by the government for about 14 billion dollars, and that government bonds to that amount could be issued at a rate that would require an annual interest charge of only $420,000,000, or three per cent. C. A. Prouty, a former chairman of the Interstate Commerce Commission, and the man who is in direct charge of the valuation of the railways, in a recent address at Cleveland, in which he opposed government ownership, intimated that the cost would be in the neighborhood of 20 billions, and placed the interest charge on this sum at $600,000,000.

Mr. Prouty used the same interest rate that Mr. Thorne used; but even on the doubtful assumption that the government could sell bonds in such quantities at three per cent. there is a very wide margin between their figures. Mr. Prouty's statement reached far less of the people, but it is inconceivable that the expressions of a man of his experience shall not have more weight with those who are seriously considering the question than those of our Iowa friend. Moreover, many well-informed students of the subject believe that so great an expansion of the nation's credit could not be made without an increase in the interest rate. If either Mr. Prouty or Mr. Thorne has made a mistake of as much as ½ per cent. in the interest rate and the government should have to pay 3½ per cent., their figures would be subject to still greater variations. Mr. Thorne's $420,000,000 interest would become $490,000,000, while Mr. Prouty's $600,000,000 would be increased to $700,000,000, the figure used by President Ripley, or $28,000,000 more than the interest and dividends actually paid by the railways in 1911. The net operating income for 1911 was only $773,866,000, and in 1912 for roads earning over $100,000 gross only $755,869,000. In view of these figures it will be seen how important are discrepancies in the estimated savings varying from $180,000,000 to $280,000,000 a year.

Mr. Prouty, by reason both of his experience and of his present relation to the valuation work, finds it incumbent upon him to deal with facts more than with estimates, and is therefore, naturally, more conservative in his use of figures than is usually deemed expedient for political agitation or popular consumption, or even for quotation in the United States Senate. It is only fair to say that he expressed no intention of giving more than a rough estimate of the valuation of the railways, but he had sufficient confidence in its approximate accuracy to use it in a warning against railway nationalization, and it is interesting to note that he used the same figure for the value of the roads that was used by President Ripley, while his interest figure is much nearer Mr. Ripley's than Mr. Thorne's.

Mr. Thorne's statement, while given in exact figures, was not only an estimate, but, as it purports to be based on the market value of such railway securities as were for sale during a period of depression, can hardly fail to be lower than the real value. There has since been a substantial increase in the market prices of most railway securities. Figures do not lie, but they are dangerous in some hands.

It is significant that the present chairman of the Interstate Commerce Commission, Mr. Clark, in a recent address before the Traffic Club of Philadelphia was quoted as opposing government ownership in this country, saying that foreign experiments have not always been satisfactory; that while nationalization had been successful in Germany, the results in France have been far from good. Mr. Thorne, therefore, not only finds himself at variance with President Ripley and other railway men, but with the present and a former chairman of the Interstate Commerce Commission.

A NEW PHASE OF REGULATION IN OKLAHOMA

RAILWAY and public utility commissions are created to enforce the laws regulating railways and other public utilities, and are required to do so. There is no provision, even in Oklahoma, authorizing a commission to busy itself in encouraging people to violate the statutes or in attempting to compel railways to. But the Corporation Commission of Oklahoma has a novel conception of its functions; and among recent manifestations of this have been its encouragement of persons traveling in Oklahoma to violate the Interstate Commerce Act, and its attempts to intimidate the railways in that state into violating it, also.

There is a law in Oklahoma which fixes two cents a mile as the maximum passenger fare within the state. The maximum legal fare in the adjoining state of Texas is three cents. The rate which the railways have fixed for interstate transportation between points in Oklahoma and points in Texas also is three cents. The tariffs containing the interstate fares are on file with the Interstate Commerce Commission. They are, therefore, the only legal rates for interstate transportation and must continue to be until changed either by the voluntary action of the railways, an order of the Interstate Commerce Commission, or the enactment of a federal law. As long as they are the legal rates it is a criminal offense either for a passenger to make an interstate trip for less than three cents a mile, or for a railway to carry a passenger for less. The principle involved is the same as that applied to free transportation. The Interstate Commerce Act prohibits free travel by, or the free transportation of, any but certain specified classes of persons in interstate commerce. In states where there is no anti-pass law the railways may give, and persons may use, free passes for intrastate travel; but it has been held that if a state pass is used for a part of a continuous interstate journey by a person not legally entitled to free interstate transportation the Interstate Commerce Act is violated.

In defiance of the provisions of the Interstate Commerce Act numerous persons making interstate journeys partly within Oklahoma have sought to pay only the Oklahoma rate of two cents a mile for the portion of the journey within that state. The railways have resisted these attempts, and instructed their employees to collect the legal fares. In some cases the passengers have paid them under protest. In others they have refused to pay them and have been put off the trains. Aggrieved by these efforts of the railways to obey the law and to compel others to comply with it, these excellent citizens have told their troubles to the Corporation Commission of Oklahoma. The commission, having been created to make the railways obey the laws, and being by express provisions of the Constitution of Oklahoma a court of record, might reasonably have been expected, it would seem, to have advised the complaining citizens that the railways were simply obeying the law, and that they had better do likewise if they didn't want to be prosecuted under the Interstate Commerce Act. But while the members of the commission are legally judges they are anything but judicial. Therefore, they have sent loud and threatening protests to the officers of the railways. They have said in substance, that while it might be true that the railways were merely complying with the law and trying to get their customers to do likewise, the course followed by them was very trying and distasteful to the citizens of Oklahoma, and also excited the great displeasure of the commission; and that unless the railways desisted from their course they would make serious trouble for themselves.

Comment on the attitude of the complaining passengers is unnecessary. Comment on the attitude of the Corporation Commission is, if possible, still less necessary. It is, however, interesting, if not significant, that the member of the commis-

sion who appears to have been most zealous in encouraging his fellow citizens to violate the Interstate Commerce Act and most overbearing in efforts to intimidate the railways into violating it, is the same one who, on at least two occasions, has been an active candidate for appointment to the Interstate Commerce Commission! The fact that he has failed thus far to get himself appointed to that commission indicates that the President of the United States has not rated highly his qualifications; and his activities in connection with this passenger fare matter are hardly adapted to elevate him in the estimation of the President, or of the public—except, of course, in Oklahoma. Whether the interstate passenger fares between points in Oklahoma and in other states should be three cents a mile may be a debatable question, and can at any time be submitted to the Interstate Commerce Commission. But whether, when the legal fare is three cents a mile, the railways should collect, and the passengers should pay that rate, can hardly, it would seem, be regarded as a debatable question—except, of course, in Oklahoma. Does the fact that a notorious ex-bandit is a candidate for governor in Oklahoma really indicate, after all, the attitude of the public generally in that commonwealth toward the laws and the rights of property?

RESPONSIBILITY FOR TRANSVERSE FISSURES IN RAILS

THE article on "Transverse Fissures in Rails," by Dr. Dudley, published in another column in this issue, is the most complete and authoritative discussion of this timely and important subject which has yet been printed. Ever since the Manchester wreck on the Lehigh Valley, two and one-half years ago, the subject of transverse fissures has been one of vital interest to railway engineers and steel manufacturers. Appearing at that time as a new type of failure, rail experts were unable to explain its origin, and various theories were advanced which have since tended to cloud the real causes. This study by Dr. Dudley is based on a careful examination of many specimens of this type of failure collected on his own and other roads rather than on an examination of only a few specimens. The paper is, therefore, especially valuable, and the conclusions drawn warrant very serious consideration.

The conclusion reached by Dr. Dudley that internal transverse fissures in rails are created primarily by careless and defective mill practice is of special significance and importance, in view of the wide publicity given the frequently repeated conclusion of James E. Howard, engineer physicist of the Interstate Commerce Commission, that these fissures are the result of overloading the rails. While railway men have almost universally disagreed with Mr. Howard, they were at first able to offer little evidence to controvert him. But within recent months considerable evidence of this character has appeared. In a recent article in our columns (*Railway Age Gazette*, February 6, 1914), Robert Job described careful tests made of numerous rails immediately adjoining those in which transverse fissures were found and carrying the same amount of traffic. These rails failed to show such fissures, thereby indicating that the primary cause of the fissures "was not in the wheel loads, but rather was some inherent defect in the individual rail." In his report on the derailment on the Southern Railway near Oyama, N. C., just issued, Mr. Howard makes the significant statement that although it was necessary to remove 18 rails, only the one in which the internal fissure was found was broken, and the rest were twisted and bent without breaking.

The responsibility for this dangerous type of failure is thus being rapidly fixed on the manufacturers. A strong proof of this is the statement in Dr. Dudley's article that such failures are confined almost entirely to the product of a few mills and that the product of two of the largest mills is almost immune. The methods of working the metal to prevent segregation and to eliminate cold rolling and gagging in the straightening presses, which Dr. Dudley believes are the main causes for the formation of these fissures, are entirely under the control of the mill operators and the defective conditions can be removed. The serious wrecks which have resulted from rail breakage due to this type of fissure within the past few years should make the mill operators realize more fully their responsibility to the railways and to the traveling public. While there has been a marked change in the attitude of the rail manufacturers towards outside criticism within the past three years, there is still room for decided improvement in this regard. The investigations of defective rails, with reference not only to transverse fissures, but also to other defects, have disclosed highly discreditable conditions in the manufacture of rails, and the time has now arrived for the manufacturers to adopt strenuous means to insure that the present dangerous defects of all kinds will be removed.

NEW BOOKS

Master Car Builders' Association. Proceedings of the 1913 convention. Illustrated. Bound in cloth. 1142 pages. 6 in. x 9 in. Published by the Master Car Builders' Association, Joseph W. Taylor, secretary, 1112 Karpen building, Chicago, Ill. Price $10.

Each year the report of the proceedings of the convention of the Master Car Builders' Association has continued to grow in size, and in 1913 it reached a total of 1,142 pages in addition to 90 double page charts. This has made it advisable to publish it in two parts. Part I contains the reports of the committees at the last convention with the full discussion thereon, reports of the officers and the minutes of the meetings of the executive committee. It contains 666 pages. In Part II are the rules of interchange, the results of latter ballot and the standards and recommended practice of the association. The price has been increased from $7.50 to $10.00. This includes both volumes. At the 1913 convention there were reports from 29 different committees discussed in addition to three subjects for topical discussion. Many of these were of the utmost importance and value to the railways of the country. The volume contains the names of the members of the different committees which will report at the 1914 convention, as well as a full list of the members of the association with their addresses and the number of cars represented.

American Railway Master Mechanics' Association. Proceedings of the 1913 convention. Illustrated. Bound in cloth. 856 pages. 6 in. x 9 in. Published by the Association, Joseph W. Taylor, secretary, 1112 Karpen building, Chicago, Ill. Price $5.

The proceedings of the 1913 convention include, in addition to the full text of the reports and discussions of the various committees, a reprint of the Pennsylvania Railroad report on the tests of a superheated steam Atlantic type locomotive, which formed an appendix to the report of the committee on superheaters. This section makes the book of unusual value for reference, since the tests were most complete in every particular and contain data of great value to all locomotive designers. The volume contains the list of committees that will report at the 1914 convention as well as the usual matter included in the proceedings of the larger associations in connection with the list of members, etc.

Spontaneous Combustion of Coal. By S. W. Parr and F. W. Kressmann. Bulletin No. 46, University of Illinois. 87 pages. 6 in. x 9 in. Illustrated. Bound in paper. Published by the University, Urbana, Ill. Copies free.

In view of the fact that it is becoming quite general practice for the larger users to store quantities of fuel for the purpose of protecting themselves against labor difficulties at the mines or interference of transportation by weather conditions, a thorough investigation of the causes and prevention of spontaneous combustion is of decided value. This bulletin contains probably the most carefully prepared report on the subject that has yet appeared. In the conclusions, it lists the preventive or precautionary measures that are suggested for the prevention of spontaneous combustion, especially with bituminous coals of the Illinois type.

Letters to the Editor

CONSIDERATIONS IN RAILWAY RATE MAKING

London, January 29, 1914.

To the Editor of the Railway Age Gazette:

No student of railway economics is likely to undervalue the importance of Professor Meyer's views on the subject of rate making [*Railway Age Gazette*, January 9, page 69]. There is probably only one other man in the world who brings to the study of this question the same combination of keen intellect, economic training, and long, practical experience, and that is M. Clément Colson, who, by the by, would if I mistake not hesitate to go as far as Mr. Meyer in attaching importance to the cost element in rate fixing.

After reading Mr. Meyer's paper with great care I feel in a curious state of unstable mental equilibrium. There is hardly a word in it with which I could not express cordial agreement. And yet I feel all the time that he and I are a long way apart. *In vacuo* I agree. For the United States in January, 1914, I disagree. If the railways of the United States were not a mass of confusedly interrelated lines, but one single system; if, instead of having seventy years of history behind them, they were just starting out to frame tariffs for the first time; if, instead of being subject to the regulation of forty-nine separate sets of legislatures, courts and commissions, they were subject to the regulation of one single harmoniously organized regulating authority—then I believe rates could be fixed scientifically. Reasonable remuneration to the company as a capitalist, based on the value of the property employed, *plus* reasonable remuneration to the company as *entrepreneur* for the service rendered in carriage, would go a good way towards fixing the rate. And these two elements could undoubtedly be ascertained with substantial accuracy.

But when we come, even *in vacuo*, to consideration of value of service—and this must include value to the community, as well as value to the individual—this consideration surely belongs not so much to the domain of fact as to what Mr. Meyer excellently calls the "wide zone within which to exercise the flexible limits of judgment." And what should be the width of that zone? It may be so wide that the cost elements of the rate shrink to a negligible portion of the whole. It may be as narrow as Euclid's line. The French government frankly says that gold bullion shall pay for carriage sixteen times as much as silver bullion. The Prussian government charges (with certain exceptions) the same ton mile rate for all *Stückgut* traffic, whether its value be reckoned in cents or in dollars per pound. Therefore I cannot believe that, even *in vacuo*, the cost elements of the rate, though doubtless important, can ever be of controlling importance.

But whatever be the conditions *in vacuo*, in practical fact it is the conditions in the United States in 1914 that have to be dealt with. Some years ago it looked as though competition in the states were dying even faster than in England. Lately the government, with the full approval of the people, has been occupied in restoring competition to life by a series of galvanic shocks, which, even if they do not prove efficacious in the long run, are certainly severe. And where there are two or more competing lines, which admittedly must charge the same rate, how is the cost principle to be applied to fixing the rate? You may ascertain the reasonable cost of construction of the one and of the other, the reasonable cost of service over each under the physical and traffic conditions actually existing. But how deduce thence even the cost portion of the rate that is reasonable for both? A rate averaged between the two will be right for neither. A rate that gives a reasonable return on the better line may bankrupt the poorer. A rate that returns "the legal rate of interest" on the poorer line may give the better one a profit beyond the dreams of avarice. And the difficulty which formally confronts us only in reference to competitive rates really affects all rates. For it will not be denied that the local rates must bear some relation to the through rates.

I have instanced competition as one obstacle, which, to my mind, is insuperable and must prevent our ever obtaining in practice the consistent and scientific system of rates which is in the abstract desirable. There are of course others. There is the acquired situation which must be respected. For, undoubtedly, the injury done to a trade or district, or community, by taking from it an advantage which it has hitherto—even if unreasonably—possessed, is greater than the benefit done to another trade or district, or community, by giving to it for the first time an advantage which it always ought to have had. Then there is the welter of cross jurisdictions. There are the state commissions out for a flat reduction of rates; the commissions that deliberately regulate in order to give their own jobbing centres an advantage over competitors outside the state, and even legislatures which enact rates which their own commissions have told them are not reasonable. All these things exist, and have to be allowed for in practical politics. And so it seems to me the portion of an interstate rate resting upon the cost of service becomes so small that the whole rate practically falls within the wide zone of the flexible limits of judgment.

There is another consideration applying not merely to interstate rate fixing, but to all rate fixing on the basis of cost. A particular rate is challenged as unreasonable by a particular applicant. The regulating body can, we agree, ascertain with substantial accuracy the *average* cost of a service of the same general description as that given to the applicant. But as between a particular carrier and a particular shipper, the real question is surely not average cost, but actual cost in the special case. And special cases vary widely—sometimes very widely—from the average conditions. As Albert Fink wrote forty years ago, "no traffic ever is carried under average conditions." If a shipper is to be given a rate based on reasonable cost of the particular service rendered to him, tariffs disappear in a maze of special rates. If, on the other hand, he is given a rate based on average cost of service, he may not be getting a cost of service rate at all.

I am very far from objecting to valuation and cost accounting on their own merits. A physical valuation of the railroads of the United States will, I believe, and always have believed, be of great use to the experts in all kinds of ways that have not as yet occurred to them; and to the public at large, at least in teaching them that it is valueless for the purpose for which they wanted it. Cost accounting will undoubtedly help the railroads to see where money goes, to economize where economies are possible, and to refrain from stimulating traffic that gives no net return where economies are impossible. I agree also that it is bound to be asked for in connection with rate regulation. The natural suspicion that statistics may be made up by a railroad from one point of view when it is a question of a two-cent passenger law, and from another point of view when it is a question of the reasonableness of freight rates would be got rid of if expenses were allocated year by year to different classes of traffic on an established and systematic basis. I agree further that such allocation would be of real use to a railway commission by enabling the members to narrow in their own minds the width of the zone within which they are constrained to rely on their independent judgment. Rate cases are complicated enough at the best. If a commission can say to a carrier at the outset: "Do you accept for the purposes of this case the average valuation of your road per mile; the average allocation of cost between freight and passengers; the average terminal expense, and so forth? And if not, why not?"—the dispute is greatly narrowed, and the leaden foot of justice thereby lightened.

But there is, I think, a real danger in putting forward cost of service as the primary consideration, and relegating judgment to a subordinate and subsidiary position. No one who knows the

work of the Interstate Commerce Commission will doubt its capacity to keep all the considerations that go to the fixing of a reasonable rate in view, and to allow to each its proper value. But legislators legislate; economists, and others who are not economists, write articles; and judges decide. Now legislators, writers and judges are none of them experts in rate making. Judgment comes only from wide knowledge and practical experience in approaching rate-making problems from all sorts of angles. The judgment, knowledge and experience which a man does not possess he naturally belittles. Moreover, the judgment of the commission is helped by exhaustive consideration of documents put in, and of oral and written arguments submitted. Legislators and judges have neither time nor qualification to fortify their judgment as the judgment of the commissioners is fortified. It seems to me inevitable that if it were to go out as the opinion of the Interstate Commerce Commission, that a rate is to be based on physical valuation, plus cost of service, plus an indefinite X of judgment, in practice legislators and judges would ignore X altogether in coming to a decision. Rates would come more and more to be based on average "cost," which would be bad for the railroads, and worse for the public.

To show that my fear is not imaginary, let me instance what has actually happened in England. Under an act of 1894 our railway commission—which is a law court and not an administrative body—was given jurisdiction to decide whether a proposed increase of rate to which any trader objected was reasonable. Under that act the court has ruled that the question whether an increase would or would not send every trader on the line into bankruptcy is irrelevant, and not to be considered by the court. "What circumstances," said Lord Collins, who was a great judge, "are we entitled to take into consideration on the question of reasonableness? We are not a court of conciliation or a tribunal of honor. We are not made judges of prudence or of generosity. . . . Carriers are not philanthropists. The affluence or indigence of the persons rendering or receiving the service is beside the question." I am sure the shippers of the United States would not desire to have the reasonableness of rates judged by this standard. I am equally sure that Mr. Meyer would not desire to force it on them. And for that reason I submit that insistence on the cost element in railway rates, and the subordination of the zone, even though nominally wide of the flexible limits of private judgment, is not in the public interest.

W. M. ACWORTH.

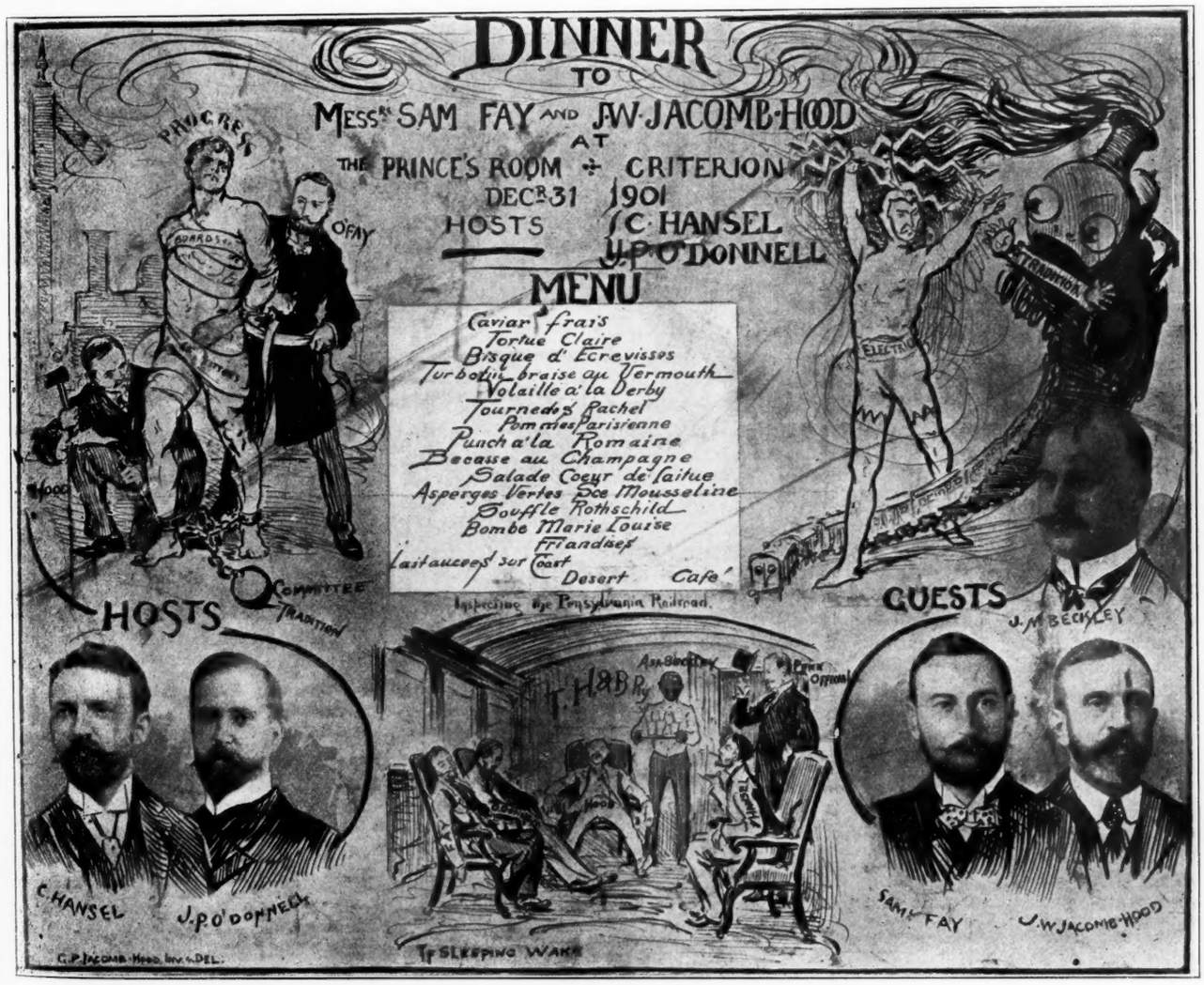
CONDITIONS THAT HAMPER THE ENGLISH RAILWAY MANAGER

NEW YORK, February 17, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The appointment of Mr. Thornton of the United States to the post of general manager of the Great Eastern of England has caused much comment by the English press.

The writer has had occasion to be familiar with the management of English railroads for the past 20 years and on several occasions has had the pleasure of escorting officials of English railways over various railroads in the United States. On December 31, 1901, the writer, with John P. O'Donnell, of London, gave a dinner in London to a number of the chief engineers and other officials of English railways.



A Cartoon of 1901

The menu card was prepared in the shape of a cartoon intended to illustrate and criticize the conditions which attend the operation of railways in England. This cartoon is some 12 in. x 14 in. in dimension. On the upper left hand corner is depicted the figure of "Progress," bound and chained by "Committees," "Boards" and "Tradition." This figure is illustrated as being freed from its bonds by Sir Samuel Fay, now general manager of the Great Central, and J. W. Jacomb-Hood, chief engineer of the Southwestern. These gentlemen, who were the chief guests of the evening, had visited the United States on two occasions and were strongly imbued with the desire to improve their work through the knowledge gained here.

On the upper right hand corner of the menu card is a figure illustrating "Electricity." "Tradition" is depicted by a train of English coaches, with their stub-end locomotive, all drawn as illustrating strong protest against the electrification of the subway, which they operated by steam locomotives.

Early in the year 1902 the writer met the late Charles M. Hays in Paris shortly after he had been requested to take charge of one of the largest railway systems in England as general manager, and, although Mr. Hays had had considerable experience with English practice (on the Grand Trunk), he expressed the opinion that it was impossible for anyone trained in American methods of organization to take successful charge of an English railway property.

It seems only fair to the railway officers of England to suggest that it is not so much a question of individual ability as it is inability of any individual on an English railway to carry into operation any new ideas. The boards of directors are not composed of railroad men, and each department of the railway operation is supervised by a committee—the members of which are sometimes disrespectfully termed "Guinea Pigs" because they receive a guinea each for attending fortnightly meetings. These committees of untrained men greatly hamper the individual who is supposed to be in charge of the department.

These committees in England are not made up of men skilled in the department which they supervise, and, instead of encouraging initiative, invention, or any change that will produce better results with smaller expenditures, they generally gage the efficiency of the head of the department by the amount of money expended in inverse ratio to minimum cost of operation or maintenance. In other words, if it has been the practice to spend $2,000 a mile in maintenance on a certain railway property, and if, by reason of economy, change of methods, introduction of new devices, and the like, the engineer in charge of maintenance should expend but $1,500 a mile, it is probable that, instead of complimenting him for such economies, he would be reprimanded because he had spent $500 less than had been expended the previous year on the same property.

After having shown the chief engineer of one of the principal railways in England our methods in the United States, and after having shipped to England, at his request, various devices such as movable-point frogs and the like, which at that time had not been used in England, he, with high enthusiasm and great courage, introduced some of the American methods and, by so doing, cut down his cost, at the same time maintaining a higher efficiency of up-keep. When these facts became known to the board of directors, they, without consideration of what he had accomplished and without appearing to desire to know whether their chief engineer had actually increased the efficiency of the property under his charge, harshly criticized him because he had not spent the full amount of money that they had covered in their budget.

It is obviously impracticable to conduct the railways in England on the same plan as in the United States. The conditions are entirely different, as illustrated forcibly by the fact that in England the railways perform practically an express business by owning their own horses and wagons and going to the door of the shipper for freight, except in the case of minerals. They also maintain large warehouses for the storage of goods for the accommodation of shippers, who frequently make a convenience of the railways by having their offices in these warehouses, bringing their customers to these warehouses to show their goods.

Generally the railways in England manufacture all of the materials and supplies which they use, even to the making of artificial hands, limbs, etc. They also generally roll their own steel and build completely their locomotives, and they do many things not considered economical by railway managers here.

I am firmly of the opinion that, if the method of organization of the English railroads were changed to conform to the best practice in the United States, there would be found many railway officers in England fully competent to deliver a satisfactory balance sheet. If the so-called "heads" of departments were so in fact instead of in name only, and were free from tradition and committees, it would be no difficult task to change the red figures to black, even though they did no more than to eliminate a portion of the very much over-manned staff.

There is much to admire in English railway practice, especially in discipline. No doubt Mr. Thornton has made it plain to his board of directors that he is to be the general manager in fact as well as by title. If he has the authority to abolish these committees, and with them the many unnecessary men which clog the various departments, he will be approved by the shareholders, but there will be great squealing among the "guinea pigs." CHARLES HANSEL.

A CORRECTION

OTTAWA, February 10, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

On page 271 of the article [Remarkable Railway Progress in Canada] which I recently had the privilege of writing for the *Railway Age Gazette* appears a deplorable blunder. In giving the facts with regard to freight tonnage I unwittingly copied the figures with reference to passenger traffic. Had I copied correctly the statement would have read as follows:

	Tons		Tons
1888.....	17,172,759	1903.....	47,373,417
1893.....	22,003,599	1908.....	63,071,167
1897.....	28,785,903	1913.....	106,992,710

There is, of course, no excuse for such an error. The only compensation for the discovery of one's fallibility is the gain to humility; and humility paves the way to Paradise.

J. L. PAYNE.

METHODS OF PACKING EGGS

CHICAGO, Ill., January 14, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was rather interested in the article: "Some Eggs Well Packed," in your General News Department, page 92, January 9, and believe that the method of handling eggs, as practiced by a large shipper at Lawrence, Kan., in the eighties, is really superior to the method mentioned in the above article.

At that time he was handling a large quantity of eggs, shipping them to European ports, and these eggs were received at Lawrence in the common egg case with pasteboard fillers, holding 30 dozen eggs each, and were repacked into barrels a trifle smaller than apple barrels, the eggs being packed in finely cut straw, 70 dozen eggs to a barrel. It was found to be a very cheap way of packing eggs. One man could pack as many as 20 barrels a day and the count of eggs in the barrels was checked very accurately by weight. As the mistakes in packing would invariably consist of a full layer of eggs and as each layer held from 4½ to 6 dozen of eggs it would show up in the weight of the barrel after being headed. There were 13 layers in each barrel with about 1¼ inches of finely cut wheat or oat straw between each layer.

Loss by breakage was so small that it was very seldom that any report was made back to Mr. Pendleton of any cracked or broken eggs. ENGINEER.

A Study of Interior Transverse Fissures in Rails

From a Report to President Smith of the New York Central Lines, Based on an Extended Investigation

By P. H. Dudley
Consulting Engineer, New York Central Lines

Specimens of transverse fissures in basic open hearth rails, collected from different roads, sections and manufacture, indicate that this latest and rare type is not found in metal of medium composition with ordinary purity and ductility, but occurs only in abnormal metal of decided fragility or limited ductility in the head incident to conditions of fabrication of the rails, which should and can be avoided. To date, this type of failure is said to be unknown in three brands of basic open hearth rail of limited output, and is rare for two of the large manufacturers, as it has been found in only three or four rails for one mill, and in one rail for the Gary mill out of several hundred thousand in service. Therefore it is not an accidental product of all mills. This has been an important feature to investigate by the process of elimination, to determine whether these fissures were due to general or local conditions of manufacture. The evidence shows that it is the latter.

The terms, abnormal or heterogeneous metal, are intended to be comprehensive and to cover segregations, all impurities, inclusions of slag, internal strains, composition and fragility of structure of the metal. Such steel is both chemically and physically

Fig. 1—Interior Transverse Fissure, 1.25 in. x 2 in., in Head of 100 lb. Open Hearth Premium (C) Rail, with 20 per cent Discard

Fig. 2—Interior Transverse Fissure, 1½ in. x ⅞ in.

heterogeneous in the rail heads, and does not undergo the ordinary steps of manufacture and finish without more or less injury to some "low rail" from the hotbeds, in a fraction of one per cent. of those manufactured. It is this small percentage of rails in which the steel is embrittled in the head and over-strained in gagging, which makes the investigation so difficult. All previous laboratory reports on one or two fissures have not been sufficiently comprehensive to suggest the combination of conditions of fabrication which subsequently tend to induce the fissures in service and how to avoid them in manufacture.

COMBINATION OF CONTRIBUTORY CONDITIONS

A combination of contributory conditions is required to make abnormal steel, then the irregular and over-heating of the ingots in the soaking pits, the cold rolling, and the bunching of the rails during recalescence of the base and head on the hotbeds, with the result that some must cool low on one or both ends, or for the entire rail, to produce the combination for the development of the interior transverse fissures afterwards by service. Some of the detailed contributory conditions of manufacture are as follows:

1. Abnormal or heterogeneous metal of limited ductility near the center of the head of the rail with initial strains. This may be from composition or fabrication, and contains by segregation a higher percentage of carbon than specified, and is over-heated. The ferrite may be nearly or all absorbed in 0.70 carbon steel. The pearlite is usually fragile and renders the texture of the metal sensitive to the wheel loads, while traces of cementite occur in some specimens.

2. The carbon is on the high side of the specification, or usually above it in the center of the head.

3. Impurities or an inclusion of slag in the steel rolled out in the head.

4. Irregular heating of the ingots on one of their sides for the head of the rails.

5. The cold rolling and rapid chilling of the metal, in rolling the section and cooling on the hotbed, introduce and leave internal strains in the heads between the outside of the metal and the

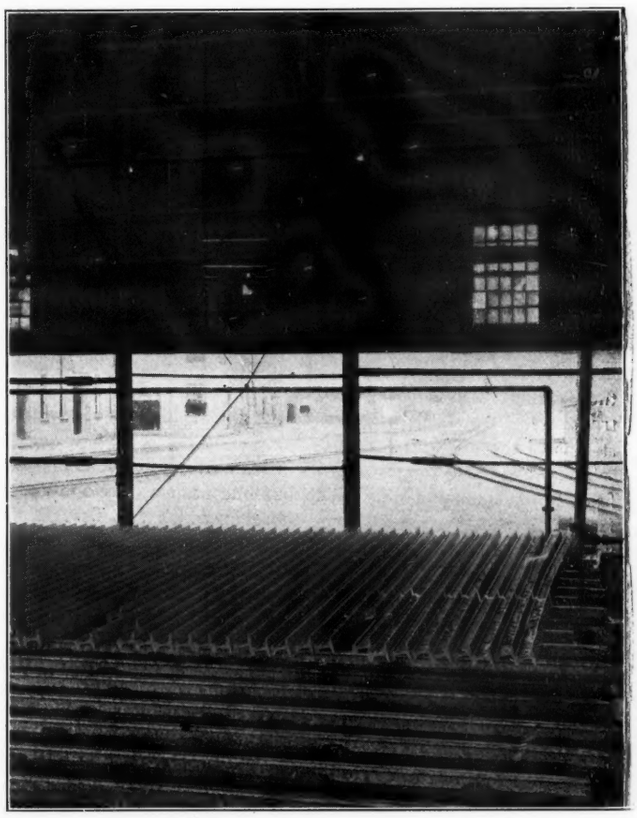


Fig. 3—Part of Hot Bed with Cooling Rails

interior, which embrittle the metal in the head of the section acting as a girder in the track. The Bethlehem Steel Company's saws are only set to allow 6⅛ in. to 6¼ in. for the shrinkage of 100-lb. 33-ft. rails instead of 6¾ in., and interior transverse fissures have developed in their output. It is not uncommon to find two and three rails per melt in some rolling which have developed interior transverse fissures in the B, C and D rails, indicating that cold rolling and irregular cooling on the hotbeds are contributory conditions. Rails rolled and cooled on the hotbeds in temperatures near zero provide decidedly contributory causes for the development of interior transverse fissures in heads, as some rails may be chilled either in the head or base for summer or winter service.

6. The irregular curves for high or low rails for their entire length or at one end on the hotbed show that the cambering

and hotbed work, and subsequent gagging in the straightening presses, should be reduced or obviated for the present traffic.

CONTRIBUTORY CONDITIONS OF SERVICE

The wheel loads should be distributed over the full bearing surface of the head, and not be carried on about one-half of the width, for then the increased intensities of the wheel loads induce permanent strains which become injurious and cumulative in the metal for each passing wheel, and destructive deformation occurs.

To develop the interior transverse fissures in service from the weakened or checked nucleus of the abnormal metal in the head of the rail, requires one or two years under heavy traffic, and from four to six years under light traffic with summer temperatures when the rails are fully expanded, as the increased thermal stress augments the internal strains of fabrication.

The tensile strains in the head of the rails which from a weakened or checked nucleus develop the interior transverse fissures in the abnormal metal above described are only those of the negative bending moments following the wheel spacing of the locomotives and equipment, which normal metal withstands without injury.

The way the traffic runs, with or against the direction in which the rails were rolled, must be considered when complete evidence is collected for this type of failure.

GRADES OF METAL

To date there seem to be two grades of metal in the heads of the rails in which interior transverse fissures develop: A soft, decarbonized exterior of the bearing surface of the head, with impurities in the steel which flows under the wheel loads, and does not sustain their pressures without a disturbance of the metal from ¼ to ⅜ in. in depth. The top of the head for ⅜ in. in depth may come off. In several other cases it has been noticed to spread and make the vertical sides concave.

The metal in other specimens is hard and fragile, of limited ductility in the head, and does not flow, but is readily affected by the wheel load pressures. It checks and cracks underneath the bearing surface in the vicinity of or adjacent to the interior transverse fissures, which is conclusive evidence of internal strains in the metal.

There are three classes of rails in which the interior transverse fissures develop: those in which but one fissure develops and it fractures from the head down; those in which two fissures develop in 4 to 6 ft. of the rail length, and one fractures from the head down; and those in which several interior transverse fissures develop at intervals in the entire length, where two or more fractures may occur from the head down at the same time, and pieces become detached. This is the rare but dangerous class.

CONING OF THE WHEEL TREADS AND BESSEMER STEEL

These fissures did not develop in Bessemer steel rails when the coning of the wheel treads was 1 in 38, even after the axle loads of the drivers had reached 55,000 to 60,000 lb (and 36,000 to 38,000 lb.) for the 50-ton loaded coal cars. The few fissures in Bessemer rails, which have developed in the past two or three years after 10 to 23 years' service, appeared since the coning of the wheels of the freight equipment of 1 in 20, became general.

The Bessemer rails in which the fissures were found after 23 years of service were the pioneer 5-in. 80-lb. section for the New York Central & Hudson River. They were straightened under the presses on supports 28 to 30 in. apart before I went to the mills in 1891, which supports were widened to 40 and 42 in. for the stiff rails 5 to 6 in. high. The heavy gagging in those two rails in which fissures developed became an important clue to their injury, while being straightened. The permanent set of the metal in the head due to the gag on the base could still be identified.

The standard coning for the wheel treads of the New York Central Lines for the past 18 months has been a return to the former 1 in 38, for the tires of the locomotives, and also for the solid steel wheels and tires for the passenger equipment. Old tires and wheels are re-turned to the contour of 1 in 38 as the equipment goes through the shops. Means are being taken to secure similar action by the Master Car Builders' Association for the new cast iron wheels for freight equipment. This is to permit the wheel treads to distribute their loads over the full width of the bearing surface of the head under moderate wheel pressure intensities for favorable action between the wheels and rails.

STRESSES IN THE BASES OF RAILS UNDER MOVING TRAINS

The spans of the bending rails under the wheel loads are governed by the wheel spacing instead of by that of the crossties, and the section of the rail resolves the moving wheel effects in the head and base into longitudinal compressive strains in the head and tensile strains in the base, directly under the wheels, which reverse at the points of flexure in the wheel spacing so that the head is in tension and the base in compression.

The wheel load effects, as above indicated, are distributed by the rail section in two parts: the positive bending moment under the wheel loads and its counterpart, the negative bending moment in the wheel spacing.

Each fissure starts from a weakened nucleus of abnormal or heterogeneous metal, just above the midway depth of the head, and develops by the tensile strains of the negative bending moments in the wheel spacing for the wheel bases of the passing equipment. These strains vary from one-fifth to one-third of those in the base of the rail for the positive bending moment directly under the wheel loads, according to its section modulus.

The tensile strains in the head of the rail, which occur only in

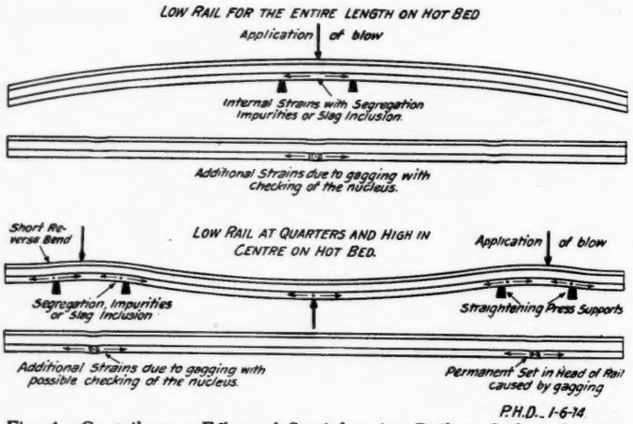

LOW RAIL FOR THE ENTIRE LENGTH ON HOT BED
Application of blow
Internal Strains with Segregation Impurities or Slag Inclusion
Additional Strains due to gagging with Checking of the nucleus.
Short Reverse Bend
LOW RAIL AT QUARTERS AND HIGH IN CENTRE ON HOT BED.
Application of blow
Segregation, Impurities or Slag Inclusion
Straightening Press Supports
Additional Strains due to gagging with possible checking of the nucleus.
Permanent Set in Head of Rail caused by gagging
P.H.D.-1-6-14

Fig. 4—Contributory Effect of Straightening Rails to Induce Interior Transverse Fissures

the wheel spacing, indicate that the most rapid development of the interior transverse fissure will take place in the summer or autumn temperatures when the rails of abnormal metal are expanded, or under thermal stress, which augments any initial stress in the interior of the rail heads.

The bright surfaces of the interior transverse fissures show by the uninjured type of intergranular nucleus that the interior of the head is under so great initial tension, even when it is in compression directly under the wheel loads, that the broken nucleus does not come together, but the upper and lower surfaces may touch in the bending of the rails under the passing wheel loads.

The fissures develop as thin, lenticular spaces, which interrupt the longitudinal strains, and set up stresses at right angles in the metal of the head, which augment their development. A fissure started in the head from the weakened nucleus may continue to enlarge during the cold weather before the rails under tension can render in the splice bars. The interior transverse fissures, which occur in tires having initial strains of fabrication, develop as lenticular spaces from the shrinkage strains of the metal on the wheel centers to hold them in position. The surfaces of the fissures do not show any indication of ever being in contact after they are checked.

To date, apparently, five varieties of nuclei are being studied: intergranular, spherulitic, non-ductile metal, slag inclusions and impurities, which seem to be associated with metal having inter-

nal strains in the interior of the head. The subsequent development of the fissures seems to be intra-crystalline with slight selective exceptions. The nuclei which can be checked or weakened under the gag, as a rule, are too minute for chemical analysis, and are studied under the microscope. The non-ductile metal may only disclose checks or cracks and impurities.

CAMBER OF THE RAILS AND THE HOTBEDS

The rails should be cambered according to temperatures when they leave the hotsaws, as the automatic machines over or under camber many rails, which increases the work required under the straightening presses. The recalescence of the base of the cooling rails on the hotbeds straightens the rails in a few seconds, and then reverses the camber. This is followed by the recalescence of the head which restraightens the rails, and soon increases the original camber; then, as the rails cool, they retain more or less vertical and side curves. These irregularities are increased when the hot rails are bunched on the hotbed to cool, and some rails go to the straightening press, high or low for their entire length, or high or low at one or each quarter, and internal strains are sometimes left in the rail heads.

The hotbeds of the Maryland Steel Company, at Sparrows Point, Md., constructed in 1890, have endless chain carriers with dogs 1 ft. apart, which automatically space the rails and move them slowly to the runways for the straightening presses. I had my Bessemer low phosphorus 0.06 and 0.60 carbon rails spaced 6 in. apart to cool on the hotbed of the Lackawanna Steel Company at Scranton from 1892 to 1898. Thousands of those rails are still in service, and interior transverse fissures have not developed in any of them. There are but two such rails known in the Maryland Steel Company's product since 1890, and one of those is still in the doubtful class.

The spacing of the rails on the hotbeds is of great advantage, for the rails cool more uniformly and require less blows under the straightening presses than bunched rails on the hotbeds, as the average number of extreme high or low rails is often 20 to 40 per cent. greater. Fig. 3 shows a hotbed on which the rails (three per ingot) were bunched and are close together, though most of them have cooled nearly straight. The A rail of the ingot is on the outside in the right hand corner of the hotbed, and high in the center, while the B and C rails have reverse curves at the quarter of the outside ends exposed to the air, the head being low near the end in each rail. A low rail for its entire length does not show on the hotbed, but one is represented in Fig. 4.

To straighten such a rail, the base must be shortened and the head lengthened by the gag in the straightening press, cutting the long curve into a series of short curves. The gag creates a permanent set of compressive strains in the base and tensile in the head through the entire section of metal where applied. When a rail with abnormal metal in the interior of the head is gagged, the possibility of a checked or weakened nucleus is made clear by the illustration in Fig. 4.

The combination of contributory conditions indicated may localize, and reduce the ductility of short portions of metal in the rail head to 1 per cent. or less per inch in one or more places, while on either side the ductility may be ample for service, though in an occasional rail the fragility in the head extends its entire length. The metal in the base of the same rail may also have 6 to 12 per cent. of ductility. The bases of some rails in which fissures have developed in service can be sledged and bent 40 to 60 deg. without fracture.

It is these variations in quality of the metal of the head in short distances with a more ductile base, which has made the investigations so laborious and so difficult to trace the combination of contributory causes of manufacture and service, that induce or permit the fissures to occur.

PREVENTION OF INTERIOR TRANSVERSE FISSURES

To prevent the development of interior transverse fissures in the rail heads under service, the combination of contributory causes cited must be avoided. The rail head must have sufficient ductility to undergo the ordinary operations of manufacture without injury. The rails must perform the functions of girders in the track and subdivide by the section the wheel effects into their negative bending moment in the wheel spacing, and the positive bending moment directly under the wheels.

The metal must be well purified in making the steel, and segregation prevented in the setting ingots, to give practically the ductility incident to a suitable chemical composition. This has been done in the manufacture of hundreds of thousands of tons of basic open hearth steel rails, with prevention of interior transverse fissures under modern traffic.

The interior transverse fissures which have occurred in the rails with heavy bases of the A and B sections of the A. R. E. A., and the P. S. section of the P. R. R. show that the design of the section does not convert abnormal metal into good in the head of the rail, and that the essential basis of purity and quality is an imperative requirement for any section.

The present types of ingots should be rectangular, massive, short and stubby, with the length less than three times the largest dimension of the base. The minor or interior shrinkage in such an ingot is proportionately less than in the long ingots with small bases, and segregation is reduced in the steel which sets quietly in the molds due to its composition under fair mill practice.

To insure pipeless rails with present form of molds, the ingot should be promptly stripped and charged into the reheating furnaces as soon as the metal caps on top, before the minor shrinkage cavity barely starts in the top of the ingot, so that it appears only as a trace in the bloom, which is removed in the discard. Provision is made by the templets for the passes for the major or exterior shrinkage of the hot ingot to cold metal, and this does not require other attention. The ingots should not be overheated on the sides which form the head and base of the rail, nor should the blooming check the skin of the ingot for either of those sides.

The reduction and elongation in the three passes before the finishing should not be too great, otherwise internal strains may be left in the center of the head in rolling. There is also a tendency on the part of some manufacturers to increase the number of passes in the rail trains.

The most numerous developments of interior transverse fissures in rail heads have been in those rails which were rolled cold under direct rolling, with the saws set 33 ft. 6⅛ in. apart for 100-lb. rails, but less for lighter sections, and the rails bunched on the hotbeds. This fact of injury to the metal as a girder by cold rolling has been ascertained by repeated tests in steel, which should give 14 to 16 per cent. ductility in the base, but which was reduced to less than 4 per cent., and under 1 per cent. in the head of the chilled and embrittled metal. The rails should not be rolled too hot, for then the texture is also injured.

In studying a transverse fissure rail failure the entire rail should be saved and the exact length of each part noted and the location of the crossties with reference to the fracture; then the rail should be examined for the hotbed and straightening press work, and its service conditions in the track, all of which, with the mill practice of the maker, should be considered in the investigation.

The research is now so complete that in three red hot butts of a segregated high carbon rejected melt at the mill, I made the heads low, and left internal strains in the interior of the head as they cooled. The butts were then placed under a straightening press to be gagged by a series of light blows which were only secured for the last butt, as most of the liners had to be removed from the head of the press. The first butt broke on the first blow; the second, on the 24th blow, and the third, on the 198th blow. The permanent set was not completely reduced in any of the butts, yet in each the metal gave way first in the interior of the head, the fracture radiating from a nucleus to the exterior metal.

It will be possible to start an interior transverse fissure in abnormal or heterogeneous metal in a gagged butt with a weakened or checked nucleus by a series of several thousand light blows at the mills. Metal without segregation, impurities and internal

strains will not develop the interior transverse fissures. This new test made occasionally at the mills will aid the maker and consumer to obtain normal metal in the finished rail.

The detailed information above will enable the manufacturers to co-operate and prevent the combination of contributory causes of fabrication, and avoid subsequent development of the interior transverse fissures in the rail heads by service. It is just as important for the manufacturer as for the consumer to comprehend the principle that the rail section is a girder in the track to distribute the moving wheel loads to the crossties, ballast and roadbed, and to perform its functions with safety requires ductility in the head as well as in the base.

LOADING FREIGHT INTO THE RIGHT CAR

A prominent traffic officer of Canada has adopted the following simple scheme for guarding against errors by truckmen at freight houses; and he secures his routing information "at the source," so to speak; that is to say, the responsibility for furnishing the information needed by the loader as to where a certain town is situated, and as to what station a shipment ought to be billed to, is put on the receiving clerk, who signs the bills of lading presented by the shipper, and who, therefore, is presumed to be well informed on geography.

Our correspondent says:

The wrong loading of freight is one of the worst difficulties railways have to contend with. When freight is placed in a car for which it is not intended, it is very hard to locate, and is the cause of many claims, as well as of great annoyance to shippers and consignees. The following system, now in use, at two important points,* is working very satisfactorily:

1. Cars placed at the sheds for merchandise are always given shed numbers from 1 up, as may be required. These cars are placed opposite the same doors and in the same order each day; and with each car so placed, there is a rubber stamp showing the shed number of the car in figures about ¾ in. high.

2. When teamsters arrive at the shed, the shipping bills are delivered to the foreman or assistant foreman of the shed. These men being the most competent and knowing the railroad geography of the country thoroughly, and having the shed list of the cars in front of them, place the shed number of the car on each shipping bill, using a distinctive colored lead pencil, say red for the foreman and green for the assistant foreman, in large figures, not less than 1 in., written very plainly. No other shed employees are allowed to use pencils of similar color. The railroad number and the initial of the car is put down in black by the same man at the same time. The bills are then to be handed to the checker, who also checks against his shed list to correct any errors.

3. The checkers are furnished with pads of blank paper about 2 in. by 4 in. in size. The checker hands one of these slips to each trucker, for each truck load, with nothing more on it than the shed number of the car, in legible figures at least 1 in. high. These furnish the trucker a perfect guide to the car, and after unloading his truck in the car, he stamps the slip with the rubber stamp found in this car, and on his return to the checker, hands the slip to him. The checker at a glance sees whether the numbers correspond, and if so, he puts the paper in his pocket, simply to keep scraps from being scattered around the shed.

4. Transfer freight is handled in the same manner. The system in proper operation makes it much easier to train new truckers and checkers. Foreigners, who do not understand the English language do understand numerals, and work like machines.

With this system, the agent is in a position to hold the individual man responsible whenever a wrong car number or shed number is placed on the shipping bill. The color of the shed number designates the party at fault; and as each checker is supposed to initial his bill when it is completed, he also is spotted should he make a mistake; and by keeping a record of errors, it is possible to weed out incompetent men. The plan also has a tendency to make them feel their responsibility, and it results in efficiency.

The expense of installing this arrangement is very small; only the cost of the rubber stamps and pads, and a small shelf with a back large enough to show the shed number of the car in figures 3 in. high.

The plan causes no loss of time with checkers and truckers, and by cutting down the overs and shorts it saves valuable time of high class clerks in the local office and in the freight claim agent's office. At the general offices also a great deal of time, energy and stationery is used up tracing lost freight, and this loss is reduced.

*On the Toronto, Hamilton & Buffalo, at Hamilton and Brantford. At Hamilton about 50 cars a day are loaded.

COMMISSION SHOULD PRESCRIBE MINIMUM RATES

B. H. Meyer, of the Interstate Commerce Commission, addressed the Traffic Club of Kansas City on February 18, advocating that the commission be given the power to prescribe minimum rates and opposing the idea that the commission should be required to approve security issues. He was quoted in part as follows:

"Not the bond and stock issues of the railways, but their actual value is the proper measure of rates. The government should in some way furnish, for the benefit of investors, all the facts connected with such enterprise, but it should not compel the Interstate Commerce Commission to pass upon bonds and stocks. The facts concerning the bonds and stocks outstanding should be sufficient protection to investors.

"On the other hand, investors are likely to be misled should the commission be forced to give its approval to stocks and bonds. This approval might be—and I know that it would be—construed as a government guaranty of the issue in question.

"I know of several instances in which the permit to issue stock given by the Wisconsin Public Utilities Commission was used almost as a state guaranty in the sale of stocks, and that without any misrepresentation, so far as I could discover.

"I object also to the plan to make the commission fix the sales price of stocks. Supposing the price is 120 today and 150 tomorrow. The price might be just and legitimate, but what would the man who has to pay 150 say to the commission? I think that to regulate the sales of stocks and bonds in such fashion is approaching the problem from the wrong angle.

"I believe, however, that the public is entitled to a certain protection in its investments. It would be well to furnish it accurate information as to the amount of indebtedness outstanding against any concern which seeks to increase its capital. With such information the investor would know what he was doing, or should know.

"I believe also that no railway should be built and its stocks sold until there is a public necessity for it—until there is some one for it to serve and some prospects of its doing a profitable business. It would be proper for the commission to have power to pass upon this phase of the matter and to require the commission's permit before a railway is built or its stock sold.

"The commission should have power to fix minimum transportation rates. Suppose boats were plying your river in such numbers as to create competition with the railways and the railways lowered their rates to drive the boats off the river. If the government forced the railways to continue to carry merchandise at the low rates and lose money, it would be an undesirable condition which nobody would care to see continued. On the other hand, the boats would be gone. If they returned you would have the same condition to face. The commission should have the power to fix a reasonable minimum rate below which carriers would not be permitted to transport goods. Then the boats and the railways could go out and compete for business, offering service as an inducement."

Economic Theory and Railway Rate Regulation

Effect of Competition on Charges Greater Than Commonly Believed. Results of Past Government Control

By G. C. Hand
Secretary, The Kansas City Southern Ry. Co.

I. RATE REGULATION

There is nothing new in the proposition that, in conditions of free competition, the prices of articles of use or consumption are determined by the supply of those articles and the demand for them. On the contrary, this principle is so well understood and so generally recognized as to have become an axiom of political economy.

Few, however, have been so bold as to suggest that competition affecting the commodity transportation is sufficiently unrestrained to exert a determining influence upon its price, and therefore to render transportation rates even relatively self-regulatory; and when made, the suggestion appears not to have been seriously entertained. The disposition is, rather, to look upon the combined agencies of transportation by rail as constituting at least a semi-monopoly, unaffected by competition, or, if affected at all, to so limited an extent as to necessitate what might aptly be termed artificial regulation.

But is this true, or is it one of those plausible though premature conclusions which, seemingly accurate, fail to withstand the test either of critical analysis or of practical application? Are the instrumentalities of transportation so combined as to preclude effective competition? Railroad men assert that concerted action is difficult to obtain, and it is a matter of common knowledge that the so-called gentlemen's agreements respecting traffic matters, prevalent a decade ago, were never of binding effect and each in its turn soon failed utterly.

Since the enactment of the Hepburn amendment to the Act to Regulate Commerce, in 1906, the rate on a given commodity or class of commodities between the same point of origin and the same destination, has been generally fixed and uniform. An exception should be noted as to the so-called differentials, which include those cases where one common carrier is under a disability as regards the character of service. The freight rate may be lower over a route partly by water, where the cost of service is reduced, the movement less rapid, and the delivery less prompt. A few inequalities remain, due to possible combinations through different basing points, or centers of rate making. A corresponding condition exists with respect to passenger traffic, occasioned by the incidence of transportation in part by water, high rates of speed, special equipment, etc. The rule, nevertheless, is as stated: that between a common origin and a common destination, the rate by all routes is the same.

The routing which traffic will take to an ascertained destination, therefore, depends in large measure upon the character of service rendered; that is, upon such considerations as the location of terminals in cities and towns, whether convenient or otherwise for the traveler and the shipper or receiver of freight; the rapidity and regularity of movement, provision for comfort and safety, good will, and not infrequently upon mere personal influence.

This is the competition which lies on the surface, and which is apt to be suggested to the mind when menton is made of the subject. It is acute and expensive, and engages the activities of tens of thousands of persons. Traffic expenses of railroads reporting to the Interstate Commerce Commission for the year ended June 30, 1911, amounted to $59,166,364, the major part of which represented solicitation. Clearly, however, competition such as this is not of a kind or degree to go far toward determining the level of rates.

The discussion which follows will have to do primarily with the rates of freight transportation, for the reason that revenues from passenger traffic in the United States during the fiscal year 1911 constituted only 23.59 per cent. of the whole, and for the further reason that, broadly speaking, passenger rates are subject to the same influences as freight rates.

But there is a competition in transportation of a kind which, while less evident, is incomparably more potent. Coal from Pennsylvania competes with coal from Illinois and Colorado; steel from Pittsburgh with that from Bethlehem, Philadelphia, Birmingham, Denver, and the environs of Chicago; lumber from the South Atlantic and Gulf states with that from the Pacific slope; marble from Vermont with the quarries of Georgia, Tennessee and Oklahoma; granite from West Virginia with the product of Virginia, the Carolinas, Georgia, Tennessee, and the Rocky mountain states; fruits from New York, New Jersey, Georgia and Florida with those of California and the northwest.

Finally, Vermont marble strives for supremacy, not only with the Georgia and Oklahoma product, but with granite, sandstone, brownstone, pressed brick and cement from the four points of the compass. Pennsylvania coal is in competition, not alone with coal from Illinois, Colorado and other places, but with fuel oil from Pennsylvania, Kansas, Oklahoma, Louisiana, Texas and California, and to some extent with natural gas and wood. Soft woods are in competition with hard woods. In a measure, wheat, rye, corn and barley compete with one another; and so on almost without limit through the length and breadth of the country and the almost innumerable list of commodities offering for movement.

Hence, if there is demand for building materials at, say, some such central point as St. Louis, the carriers interested in the transportation of Georgia marble must make a rate so low as to compete successfully with the Vermont, Oklahoma and Tennessee fields; and further, with the various other building materials capable of substitution, produced in different parts of the country; or else forego the movement entirely.

It is a fact well known in transportation circles that few roads have a traffic that is balanced as between directions. The prevailing movement is north, south, east or west, and in the opposite direction locomotives and train crews are hauling large numbers of empty cars, amounting often to trainloads—an operation scarcely less expensive than if the cars were loaded to their capacity, but yielding no revenue. Railroad managers know, too, that if a traffic can be had for these empty cars, the revenue derived from it is almost entirely profit; and even though the rates be low, it is overwhelmingly advantageous to avoid this heavy movement of unproductive tonnage. It would be strange, indeed, if, in competing with the various other localities and the multiplicity of materials, the would-be carrier did not also have to compete with cars and trains already moving but not fully loaded or wholly without lading.

On any extensive railroad system there will be found numerous industries that are purely local to it; that have no other means of outlet; and yet the traffic of these industries is in a high degree competitive, because the markets reached by them are competitive. If rates were substantially advanced by that particular line of road, without corresponding advances on the part of other roads perhaps having no physical connection but serving the same general area, those industries would have no

option but to remove their plants to other locations or to suspend operations entirely—a contingency that no well-advised management is willing to invite. The traffic manager is confronted on every hand with traffic that will not move except at a low rate. If it does, it will gravitate to another and perhaps a nearer center; he may derive no benefit from the movement, and a rival carrier may establish itself in the rightful territory of his road.

The commercial radius of every city and town is practically measured by the facilities for and rates of transportation; and if the roads there converging can extend their operations into the territory of competing centers and roads, and obtain a traffic that otherwise would move by other routes to different markets, they are ever ready to embrace the opportunity, even though at scant profit to themselves and at the risk of provoking reprisals. This is accomplished through the media of low rates and the best service compatible with those rates.

Thus competition is seen to be manifold in its nature. There is competition among railroads, localities and commodities; between transportation by water and that by land; cheap construction and expensive construction; efficiency and inefficiency; the mountain grade and the water-level line, and by reason of the varying traffic and operating conditions peculiar to rival carriers.

The varying capital costs of competing railroads, the differing volumes of traffic available to each, the variant conditions of operation, the exigencies of competition itself, and considerations of the value of service—establish maxima in transportation rates which it is impracticable to exceed, as well as minima below which they may not be depressed.

The establishment by an individual carrier of a schedule of rates unduly high would operate to exclude the products of its territory from the centers of distribution and consumption, and to exclude the consumptive capacity of its territory from the centers of production and distribution; involve the sacrifice of much of its legitimate traffic to its competitors, and render certain its relative or absolute financial failure. Neither would it be in the public interest, nor necessarily lawful, so to reduce rates as to bring undue financial embarrassment upon a less efficient rival.

The maximum practicable rate is reached at the point where, by reason of excessive charges, traffic would cease to move. The minimum practicable rate is the point at which the carrier most advantageously situated and most capably administered, would cease to be reimbursed for the expense involved in rendering the service; the point, in other words, where profit vanishes. Within these limits individual rates, and consequently the general level of rates, are determined primarily by value of the service, modified by the several phases of competition. Except in rare and extreme cases, capitalization has no determining effect upon a specific rate.

This is true whether the amount of invested capital be large or small. Apart from those occasions when confiscation is threatened, or believed to be threatened, capitalization or property investment is seldom if ever advanced as a basis either for rate making or rate regulation. Rates, therefore, may be adjusted to capitalization (actual or nominal) only within the narrowest limits. On the other hand, the necessity has arisen, not infrequently, for the adjustment of capitalization to the revenues realized from the application of a practicable schedule of rates to the traffic available.

". . . It is now pretty well understood that fixed charges do not directly affect rates; nor do dividends affect them, except in so far as a road which is paying very high dividends may reduce rates lower than it otherwise would, in order not to tempt new capital into the field. But while fixed charges are not taken into account in making rates, the *prospective* traffic and rates are (or ought to be) taken into account before incurring fixed charges. . . ."—Railroad Transportation, Its History and Its Laws, A. T. Hadley, p. 265.

The tendency is opposed to a general, or "horizontal," increase in rates by a concert of action, for the reason that it would exert a disturbing influence upon the business of the country, including that of the railroads themselves; cause a shifting of territory from one market to another, and of traffic from one road to another; and involve a maze of detail in the necessary adjustment, which could not by reasonable possibility be agreed upon. And this tendency could only be overcome by urgent necessity.

The rate, for example, on citrus fruits in carloads from California basing points to New York is $1.15 per 100 lb.; from Jacksonville, Fla., to New York, the rate in carloads is 53 cents per standard crate of 80 lb., the equivalent of 66.25 cents per 100 lb. An advance of 10 per cent. would result in the creation of a differential, adverse to the California grower and the carriers interested, of 4.87½ cents per 100 lb. On a minimum carload of 24,000 lb., this would amount to $11.70; on a trainload of 30 cars, it would be $351. It is somewhat more than questionable whether the eastern lines would consent to equalize by a greater rate of increase, even if competition by water would permit it. Then the transcontinental route would either have to submit to the establishment of this adverse differential or refuse to join in the advance. So it would be with other locations, other commodities and other railroads.

But, it will be inquired, does this same condition not operate to prevent reductions in rates? The answer is that it does not, and the reason is manifest. When a rate is *elevated*, there is a premium on non-concurrence by competing roads; when it is *lowered*, non-concurrence is penalized. If an individual carrier reduces a rate or schedule of rates, even though its competitors concur in the reduction, it will enjoy its full share of whatever direct benefits may follow, besides perhaps a collateral advantage through the promotion of good will. If its competitors, direct and indirect, fail to meet the reduction, then the carrier initiating it will control the major part of the traffic affected. In the event that rates were advanced, the case would be different. If competing roads did not concur, the inaugurating road would sustain a loss of traffic.

"Yet competitive traffic, though limited to perhaps a small number of points on the railway net, affects in some degree the whole. Local rates cannot be too flagrantly out of accord with other rates, partly because of public opinion and possible public action, partly because local business will dwindle if disproportionately burdened. So long as railway competition persists—and it is apt to remain through the early stages of development—it exercises a check, more or less spasmodic, yet in some degree effective, on the general range of rates."—Principles of Economics, F. W. Taussig; Vol. II, p. 394.

It is a fair inference that Dr. Taussig has here in mind only a part, and a minor part, of the sum total of effective competition.

"Even where a monopoly does not fear direct competition, there are many cases where it is subjected to similar restraints in an indirect manner. If there is but one railroad in a certain section of country, and this has a monopoly of available routes for reaching the market which the producers of the district naturally seek, the shippers are apparently at the mercy of that company and its agents. But if there is another railroad line which supplies the same market with goods from another section, it is all but inevitable that the competition of the two districts with one another should regulate the price which the railroads can charge. We cannot have two different prices for similar goods in the same market. If the supply and demand of wheat at Liverpool fixes the price of wheat in the Liverpool market at a certain rate per bushel, the railroad and steamship lines in every direction must make their charges such that the wheat producers, in the sections which they can serve, can ship their supplies at a profit. Some of the transportation agents may disregard this necessity for a year or two, but not permanently. The penalty for such disregard is the destruction of the traffic on which the transportation route makes its living. The railroads of the United States, of Russia, and of British India feel one another's competition in determining the prices which they can charge on their international traffic."—Economics, A. T. Hadley, p. 162.

The historical aspect of the case is just what its logic would indicate. The times when the several state and federal rate-regulating bodies came into existence, are set forth in the accompanying exhibit:

STATE AND FEDERAL RAILROAD COMMISSIONS

State	Designation	Date	Remarks
Maine	Railroad Commission	1858*	
Illinois	Railroad and Warehouse Commission	1871*	
	Public Utilities Commission	1914*	
Minnesota	Railroad and Warehouse Commission	1871*	
Rhode Island	Railroad Commissioner	1844	Abolished 1868
	Railroad Commissioner	1872*	
	Public Utilities Commission	1912*	
Wisconsin	Railroad Commission	1874*	
Missouri	Railroad and Warehouse Commissioners	1875*	
	Railroad and Warehouse Commission	1903*	
	Public Service Commission	1913*	
Iowa	Board of Railroad Commissioners	1878*	
South Carolina	Railroad Commission	1878*	
California	Board of Railroad Commissioners	1879*	
	Railroad Commission	1912*	
Georgia	Railroad Commission	1879*	
Kentucky	Board of Railroad Commissioners	1880*	
	Railroad Commission	1891*	
Alabama	Railroad Commissioners	1881*	
Kansas	Board of Railroad Commissioners	1883*	Abolished 1898
	Board of Railroad Commissioners	1901*	
	Public Utilities Commission	1911*	
Mississippi	Railroad Commission	1884*	
Florida	Railroad Commission	1887*	Abolished 1891
	Railroad Commission	1897*	
North Dakota	Corporation Commission	1889*	
	Board of Railroad Commissioners	1905*	
New Hampshire	Board of Railroad Commissioners	1891*	
	Railroad Commission	1909*	
North Carolina	Board of Railroad Commissioners	1891*	
	Corporation Commission	1899*	
Texas	Railroad Commission	1891*	
South Dakota	Board of Railroad Commissioners	1889	
	Board of Railroad Commissioners	1897*	
Tennessee	Railroad Commission	1883	Abolished 1884
	Railroad Commission	1897*	
Louisiana	Railroad Commission	1898*	
Arkansas	Railroad Commission	1899*	
Virginia	Railroad Commissioner	1877	
	Corporation Commission	1903*	
Indiana	Railroad Commissioners	1905*	
	Public Utilities Commission	1913*	
Washington	Railroad Commission	1905*	
	Public Service Commission	1911*	
Ohio	Commissioner of Railroads and Telegraphs	1867	
	Railroad Commission	1906*	
Vermont	Board of Railroad Commissioners	1855	
	Public Service Commission	1906*	
Colorado	Railroad Commissioner	1885	
	Railroad Commission	1907*	
Michigan	Commissioner of Railroads	1873	
	Railroad Commission	1907*	
Montana	Board of Railroad Commissioners	1907*	
	Railroad and Public Service Commission	1913*	
Nebraska	Board of Transportation	1885	Abolished 1901
	Railway Commission	1907*	
Nevada	Railroad Commission	1907*	
New York	Board of Railroad Commissioners	1855	Abolished 1857
	Board of Railroad Commissioners	1883	
	Public Service Commission	1907*	
Oklahoma	Corporation Commission	1907*	
Oregon	Board of Railroad Commissioners	1887	Abolished 1898
	Railroad Commission	1907*	
Pennsylvania	Railroad Commission	1908*	
	Public Service Commission	1914*	
Arizona	Railway Commission	1909*	
	Corporation Commission	1910*	
Maryland	Public Service Commission	1910*	
Connecticut	Railroad Commissioner	1890	
	Public Utilities Commission	1911*	
New Jersey	Board of Railroad Commissioners	1907	
	Board of Public Utility Commissioners	1911*	
New Mexico	Corporation Commission	1912*	
Massachusetts	Board of Railroad Commissioners	1869	
	Public Service Commission	1913*	
West Virginia	Public Service Commission	1913*	
Idaho	Public Utilities Commission	1913*	
Delaware			None
Utah			None
Wyoming			None
United States	Interstate Commerce Commission	1887	
	Interstate Commerce Commission	1906*	

*With mandatory powers in respect of rates.

There follows also a statement setting forth the average freight rates per ton per mile, and the average passenger rates per passenger per mile from 1882 to 1911 for the country at large, as reported by the Interstate Commerce Commission and for the state of Massachusetts, as reported by the State Board of Railroad Commissioners:

AVERAGE FREIGHT AND PASSENGER RATES PER MILE IN UNITED STATES AND MASSACHUSETTS

Year	United States		Massachusetts	
	Freight	Passenger	Freight	Passenger
1882	*1.24c.	*1.85c.	1.71c.	2.00c.
1883	*1.22	*2.42	1.72	2.00
1884	*1.13	*2.36	1.64	1.92
1885	*1.06	*2.20	1.59	1.88
1886	*1.04	*2.19	1.64	1.88
1887	*1.03	*2.28	1.62	1.85
1888	1.001	2.349	1.55	1.90
1889	.992	2.165	1.50	1.87
1890	.941	2.167	1.45	1.82
1891	.895	2.142	1.42	1.83
1892	.898	2.126	1.36	1.83
1893	.878	2.108	1.39	1.83
1894	.860	1.986	1.33	1.80
1895	.839	2.040	1.28	1.78
1896	.806	2.019	1.28	1.79
1897	.798	2.022	1.25	1.80
1898	.753	1.973	1.22	1.78
1899	.724	1.925	1.18	1.77
1900	.729	2.003	1.22	1.75
1901	.750	2.013	1.20	1.75
1902	.757	1.986	1.24	1.73
1903	.763	2.006	1.23	1.73
1904	.780	2.006	1.27	1.72
1905	.766	1.962	1.14	1.70
1906	.748	2.003	1.23	1.70
1907	.759	2.014	1.19	1.65
1908	.754†	1.937	1.17	1.63
1909	.763†	1.928	1.19	1.64
1910	.753†	1.938	1.18	1.65
1911	.757†	1.974	1.17	1.72

*Statistical Abstract of the United States.
†Switching and terminal companies not included.

In 1882 there were twelve state regulating bodies exercising authority over rates. In that year the average freight rate for the country was 1.24 cent per ton mile.

From 1882 to 1887 three new state regulating bodies were established, with authority over rates. In that time the average freight rate declined to 1.03 cent per ton mile; a reduction of .21 cent, or 16.94 per cent.

Between 1888 and 1899 eight additional state commissions were constituted, with authority in respect of rates. In that period the average freight rate declined from 1.001 cent to .724 cent, the lowest level yet reached; a reduction of .277 cent, or 27.67 per cent. At that time fewer than half the states had commissions, they were relatively inactive, and as their jurisdiction was restricted to intrastate rates it extended only to a small fraction of the aggregate traffic. This marked decline can therefore scarcely be ascribed to the influence of the commissions then existing, any more than the advance which is to follow can be attributed to it.

Between 1899 and 1906 five further state commissions were constituted, with jurisdiction over rates. In that time the average freight rate underwent an increase from .724 cent to .748 cent; an advance of .024 cent, or 3.03 per cent.

In 1906 the Interstate Commerce Commission was clothed with jurisdiction over rates affecting interstate traffic. This gave a new impetus to the creation of state bodies. Since then thirteen further state commissions were created or had their powers so enlarged as to cover like authority with respect to intrastate traffic. This does not include the Corporation Commission of New Mexico, established in 1912, the Public Service Commissions of Massachusetts and West Virginia, created in 1913, nor commissions subsequently established.

In the five years elapsed from 1906 to 1911, the average freight rate has remained virtually stationary, having undergone a net advance of only .009 cent.

So much, therefore, for the tendency of rates under the influence of state and federal regulation by commission. But what of that tendency uninfluenced by the powers and activities of those bodies? In order to answer this question, it is necessary to have recourse to the records of the Board of Railroad Commissioners of the state of Massachusetts—the only jurisdiction, so far as the writer's knowledge extends, not (until a late date) having a commission "with power" and yet possessing reliable data in regard to rates.

From 1882 to 1892 the average freight rate in Massachusetts declined from 1.71 cent to 1.36 cent; a reduction of .35 cent, or 20.47 per cent. From 1892 to 1902 the decline was from 1.36

cent to 1.24 cent; a reduction of .12 cent, or the equal of 8.82 per cent. Between 1902 and 1911 the decline was from 1.24 cent to 1.17 cent; a reduction of .07 cent, or 5.64 per cent.

The decline, therefore, which freight rates in general underwent during the twenty-nine years from 1882 to 1911, largely under the control of commissions to the year 1906 and almost exclusively so since that time, was .483 cent, or 38.95 per cent.

In Massachusetts, in the absence of regulation by commission, the decline during that period amounted to .54 cent, or 31.58 per cent.—a considerably greater actual decline, but a somewhat lesser proportionate one. It should be remembered, moreover, that in 1882 Massachusetts had already advanced to a further stage of development than that to which many of the newer states have yet attained; so that no such growth in traffic density should there be looked for as in the country at large.

It is borne in mind, of course, that these rates relate exclusively to intrastate traffic. The level of freight rates in Massachusetts is in full accord with the extremely short haul necessarily entailed by the boundaries of a state having an area of only 8,266 square miles—less than one-seventh of the territorial extent of Georgia—and with the preponderance there of high-class manufactures and merchandise traffic.

Passenger rates in that commonwealth are affected by short distances on the one hand, by a large proportion of commutation travel on the other, and rule well below the average.

But how explain the tendency to advance in freight rates in the country from 1899 to 1911? It is well known that there has been no general increase in class and commodity rates during that time which would account for the phenomenon, and the explanation must be sought for elsewhere. The first reason to suggest itself is that the higher classes of traffic, taking higher rates, may have increased in greater proportion than raw materials and other low classes of traffic. An examination of the facts indicates that this is precisely what occurred.

The term divides itself into two portions—one from 1899 to 1904, when the average rate advanced from .724 cent to .780 cent per ton mile; and the other from 1904 to 1911, when the average rate remained practically stationary, with a net decline from .780 cent to .757 cent.

Data for the accompanying statement regarding the tonnage transported by railways are taken from the annual statistical reports of the Interstate Commerce Commission.

Classified Statement of Tonnage Transported by Railroads in the United States—For Fiscal Years Ended June 30

Products of—	1899	Per Cent.	1904	Per Cent.	1911	Per Cent.
Agriculture...	112,339,999	11.71	127,606,329	9.74	166,864,072	9.37
Animals	30,555,456	3.18	36,419,405	2.78	41,214,057	2.31
Mines	414,186,162	43.15	585,081,796	44.67	921,129,439	51.70
Forests	80,589,405	8.40	135,414,917	10.34	186,955,880	10.50
Manufactures..	114,819,161	11.96	169,558,067	12.94	267,776,334	15.03
Merchandise...	38,275,626	3.99	53,981,973	4.12	60,976,778	3.42
Miscellaneous..	40,715,346	4.24	68,542,232	5.23	73,097,558	4.10
Unclassified ...	128,326,250	13.37	133,294,446	10.18	63,623,836	3.57
Totals	959,807,405	100.00	1,309,899,165	100.00	1,781,637,954	100.00

Statement of Increases

	From 1899 to 1904	Per Cent.	From 1904 to 1911	Per Cent.
Products of agriculture.....	15,266,330	13.59	39,257,743	30.76
Products of animals.....	5,863,949	19.19	4,794,652	13.17
Products of mines.....	170,895,634	41.26	336,047,643	57.44
Products of forests.....	54,825,512	68.03	51,540,963	38.06
Manufactures	54,738,906	47.67	98,218,267	57.93
Merchandise	15,706,347	41.03	6,994,805	12.96
Miscellaneous	27,826,886	68.34	4,555,326	6.65
Unclassified	4,968,196	3.87	*69,670,610	*52.27
Totals	350,091,760	36.48	471,738,789	36.01

*Decrease.

During the first period of the term in question the increase in products of mines and products of forests (both low class) amounted to 64.47 per cent. of the aggregate increase, and at the end of the period these two classes of commodities represented 55.01 per cent. of the aggregate tonnage. Besides the smaller increase in this low-class traffic, as compared with the succeeding period, there was a greater rate of increase in certain high-class commodities. Manufactures, merchandise and miscellaneous traffic all increased at a rate in excess of the average.

In the second period the increase in products of mines and products of forests constituted 82.16 per cent. of the aggregate increase, and at the end of it represented 62.21 per cent. of the total tonnage. Apart from these two groups of traffic, manufactures was the only relatively high class of commodities which increased at a rate greater than the average.

This of itself is sufficient to account both for the advance in the average freight rate during the first period, and the slight decline during the second period of the term.

Further, the average haul per ton fell off from 246.58 miles in 1899 to 244.30 miles in 1904, indicating a slight augmentation in the average rate per ton-mile; and from 1904 to 1911 it underwent an increase to 254.10 miles, justifying a somewhat substantial diminution in the average rate.

Meanwhile, it is to be remembered that the year 1893 marked an advanced stage of the era of unrestrained and disastrous competition among railroads, when rates were already depressed out of proportion to the traffic of the time, with the result that in the two years preceding June 30, 1893, 110 railroads, representing more than one-fifth of the aggregate mileage of the United States, were forced into receivership.

This in brief outline is the recent history of the tendency of freight rates in this country. But it neglects a fundamental factor of controlling importance. Between 1899 and 1911 the prices of commodities generally advanced 28.09 per cent. If transportation rates remain stationary while the prices of other commodities advance substantially, or if they advance in a lesser proportion than other commodity prices—it is obvious that in point of fact transportation rates undergo a decline. It is one thing to say that freight rates increased 4.56 per cent. on the average in that time; it is another and a very different one to know that, adjusted to the level of prices generally prevailing, they underwent a reduction of 18.37 per cent. The accompanying statement showing railway rates as adjusted to the value of money is self-explanatory.

Statement Showing Average Freight Rates Per Ton Per Mile, and Average Passenger Rates Per Passenger Per Mile,

1. As Reported by the Interstate Commerce Commission, and
2. As Adjusted to the Value of Money,

For Fiscal Years Ended June 30

	As Reported				As Adjusted	
Year	Freight	Passenger	Index Number	Relative value of $1.00	Freight	Passenger
1888.....	1.001c.	2.349c.	.....	.....	.....	.....
1889.....	.992	2.165	.....	.....	.....	.....
1890.....	.941	2.167	.....	.....	.....	.....
1891.....	.895	2.142	.....	.....	.....	.....
1892.....	.898	2.126	$8.0579*	.....	.....	.....
1893.....	.878	2.108	7.8658	100.000c.	.878c.	2.108c.
1894.....	.860	1.986	7.0159	112.114	.964	2.227
1895.....	.839	2.040	6.4820	121.348	1.018	2.475
1896.....	.806	2.019	6.2803	125.246	1.009	2.529
1897.....	.798	2.022	5.9089	133.118	1.062	2.692
1898.....	.753	1.973	6.3271	124.319	.936	2.453
1899.....	.724	1.925	6.8375	115.039	.833	2.215
1900.....	.729	2.003	7.7917	100.951	.736	2.022
1901.....	.750	2.013	7.6059	103.417	.776	2.082
1902.....	.757	1.986	7.7066	102.066	.773	2.027
1903.....	.763	2.006	8.0093	98.208	.749	1.970
1904.....	.780	2.006	7.9047	99.508	.776	1.996
1905.....	.766	1.962	7.9414	99.048	.759	1.943
1906.....	.748	2.003	8.2312	95.561	.715	1.914
1907.....	.759	2.014	8.7681	89.709	.681	1.807
1908.....	.754†	1.937	8.4236	93.378	.704	1.809
1909.....	.763†	1.928	8.1459	96.561	.737	1.862
1910.....	.753†	1.938	8.9128	88.253	.665	1.710
1911.....	.757†	1.974	8.7583	89.810	.680	1.773
1912.....	....	.....	8.9191	88.191	.....	.....

*Six months.
†Switching and terminal companies not included.
Bradstreet's Index Number, adapted to fiscal years.

Summarized the situation in this respect is shown in the exhibit following:

	From 1893 to 1899. Per Cent.	From 1899 to 1904. Per Cent.	From 1904 to 1911. Per Cent.	From 1897 to 1911. Per Cent.
Value of money declined.	*15.04	13.50	9.75	32.53
As Reported—				
Freight rates declined....	17.54	*7.73	2.95	5.14
Passenger rates declined.	8.68	*4.21	1.60	2.37
As Adjusted to Values—				
Freight rates declined....	5.13	6.84	12.37	35.97
Passenger rates declined.	*5.08	9.89	11.17	34.14

*Advanced.

The mind does not readily grasp the significance of this immense depreciation in the value of money; what it means to the railroads as corporate entities, their stockholders and creditors, and, in a less direct sense, to the country generally. One is startled to find that, on the basis of money value fourteen years prior, these combined interests in 1911 were affected to the extent of $847,986,152.

From 1897 to 1911 the increase in the average of commodity prices was 48.22 per cent.; in the average of railroad salaries and wages, it was 28.00 per cent. The purchasing power of money therefore declined 32.53 per cent. with respect to commodities, and 21.88 per cent. with respect to salaries and wages. If labor and materials are taken as entering into operating expenses in equal proportions (which is approximately correct), this will give a lost value in connection with expenses of 27.20 per cent.

The subjoined statement is based upon the combined income account of the railways in the United States, considered as a system, for the year ended June 30, 1911, as stated by the Interstate Commerce Commission in its annual statistical report for that year. The comparison is with the fiscal year 1897.

Loss to Stockholders and Creditors.			
Dividends—net	$ 291,497,164		
Interest on Funded Debt—net..	380,411,667		
Total	$ 671,908,831		
Discount at 32.53 per cent.			$218,571,943
Loss to Railroads.			
Operating Expenses:			
Rail Operations	$1,915,054.005		
Outside Operations	61,277,859		
Non-Operating Companies....	418,987		
Total	$1,976,750,851		
Discount at 27.20 per cent.		$537,676,231	
All other Revenues and Income.	$ 282,010,384		
Discount at 32.53 per cent.		91,737,978	629,414,209
Total Revenues and Income....	$2,930,670,066		
Total Discount, as above			$847,986,152

Since the fiscal year 1910-11 conditions in this respect have become measurably less favorable to transportation. The tendency to elevation in commodity prices has undergone no abatement; and numerous advances in wages, probably aggregating well above one hundred million dollars, have been conceded. The demands of the enginemen, firemen and trainmen in trunk line territory have again been disposed of by arbitration; those of the enginemen and firemen in the West have been presented; the trainmen's demands are understood to be ready, and so it continues in an endless chain. New capital expenditures are constantly demanded by the authorities, many of them unproductive; revenues are revised downward, while expenses, interest and taxes are regulated upward.

It is of course impossible to say with the assurance of mathematical accuracy what has been the net effect of the influence of the commissions on rates. So far as indications point, it has been exceedingly limited. The changes which have occurred are susceptible of adequate explanation by other known factors. It is quite conceivable that this influence may have been negative in character; that rates would have responded to conditions which justify changes in a more natural and orderly manner if left to their own gravitation. The word *changes* is used advisedly; for when an increase ought to be made, it is no less in the general interest than a reduction when it is indicated.

The orders of the commissions remain in effect for a time specified. Furthermore, under the Act to Regulate Commerce, as amended, it is necessary before advancing an interstate rate for the carrier to assume the burden of proof and to justify the necessity for it before the Interstate Commerce Commission. Any one who knows something of the obstacles encountered in the attempt to allocate operating expenses and the uses of invested capital, first to intrastate and interstate functions, and then to freight, passenger and other service, realizes that perhaps in every case the result must be acknowledged to be nothing more than an approximation, and how difficult is the proof required. When, as most often occurs, an individual rate is singled out, the difficulty is sensibly enhanced. Only to him who does not understand is it simple and easy.

At best, the attitude which confronts the railroads is that of the advocate, rather than of the judge. Few perhaps have ever heard of the correction of an inequality by elevating the lower rate, and *regulation* has come to be synonymous with *reduction*. The managers of the railroads lack confidence that the rates attacked are those which ought to be reduced. They are uncertain what the line of attack will be next, when it will be made, or what the grounds relied upon for its justification. Therefore they feel themselves forced into the position of resisting most, if not all, reductions of rates—not improbably those which they themselves would order if left without interference, free to experiment downwards and to correct changes which prove to be injudicious.

The institution of regulation by commission itself, the necessary incidents of its operation, its intimate relation to party politics, the liability to bias and abuse,—combine to necessitate and to justify conservatism in the domain of transportation rates. It is too much to suppose either that this condition has been, or will be hereafter, wholly without effect.

But let it be admitted, for the sake of argument, that the several phases of competition to which transportation by rail is subject, are wholly without avail in the adjustment of rates to a reasonable level, and let it be conceded tentatively that the agencies of transportation constitute a pure monopoly. To what conclusion does this lead?

It is then in order to inquire whether any other force will assert itself automatically, and tend in the same direction with like effect.

In the absence of undue interference from outside sources, and until the immediate cost of rendering the service is approached, it is obviously in the interest of a carrier to depress a rate whenever and so long as the quantity of new traffic stimulated to movement thereby will compensate for the sacrifice in the rate, plus a comparatively slight augmentation of operating expenses. When the volume of traffic fails to respond correspondingly to reductions in rates, then the rate is no longer a barrier to the free movement of traffic, and it must *ipso facto* be considered reasonable.

Conditions of constant cost are virtually unknown in railroad transportation. They never exist but by accident. Were traffic and expenses to increase in the same proportion, with revenues in excess of expenses, operating costs per unit of traffic would decline. The ratio of operating expenses to gross revenues of railroads reporting to the Interstate Commerce Commission in 1911 was 68.66 per cent. According to this hypothesis, an enlargement of 10 per cent. in traffic would entail an enlargement of 6.87 per cent. (of gross) in expenses, leaving a net advantage of 3.13 per cent. of gross. Even here, interest, rents and taxes are apportioned to a larger number of units; the capital cost per unit becomes less, and the net advantage greater.

The ratio of increase in expenses will (other things remaining equal) be less than that in traffic. Many items of expense are relatively fixed and uniform. The organization must be maintained, stations kept open, schedules represented, and repairs due to decay must be made, when the traffic is light as when heavy.

". . . An increase of traffic, though it means some increase in operating expenses (probably even here not a proportionate increase), ordinarily calls for no increase of plant. Hence, for the traffic as a whole, it means decreased expense per unit. . . .

". . . Many of them (operating expenses) are incurred for the traffic as a whole, and must go on whether or no individual items of traffic are undertaken. . . ."—Principles of Economics, F. W. Taussig, Vol. II, pp. 367-9.

Economists are agreed, and experience demonstrates, that this

will continue to be so until the capacity of existing facilities is reached and additions to the plant become necessary.

F. A. Delano, president of the Chicago, Indianapolis & Louisville Railway Company has recently estimated that about 55 per cent. of the expenses of operation go on uniformly, regardless of the volume of business done.

Assuming the approximate correctness of this estimate, it follows that a 10 per cent. increase in traffic will effect a corresponding increase only as to 45 per cent. of 68.66 per cent., or 30.90 per cent., of gross. That is, the increase in expenses amounts to 3.09 per cent., and the net operating advantage to 6.91 per cent., of gross revenues. There is a direct gain in operation, and a supplemental gain in the reduced capital cost per unit of traffic.

It is therefore plain that, with an increasing traffic and notwithstanding reduced charges, the line of gross revenues will range well above that of operating cost; that is, without descent in the line of net revenue; and that this augmentation of traffic may profitably be effected at the cost of substantially diminished rates. This explains why the railroads can exist to-day with rates at a level materially lower nominally, and vastly lower actually, than would have been reasonable or practicable twenty years ago.

A railroad company earns $60,000,000 in freight revenue per annum, and it does so by moving six billion ton-miles at 1.000 cent per ton-mile. The management believes that a well-advised readjustment of rates will be profitable, and it decides to lower the various schedules by 10 per cent. to a point where they will yield an average of .900 cent per ton-mile. The result is an increase of 20 per cent. in the volume of freight traffic. Operating expenses have increased probably 5 per cent., possibly much less. Traffic that would not bear the cost of transportation is now permitted to move, and that which could move only for short distances is enabled to traverse greater ones. Each unit of traffic must bear its proportionate share of capital cost, and as the additional haul augments only a small part of expenses this is a further source of gain. Further, the consequence may have been to load cars and trains to their capacity, or to supply lading in the direction of light traffic.

The judgment of the management having been vindicated, it is decided now to make a further reduction of 11.11 per cent. to an average rate of .800 cent per ton-mile. Freight traffic increases 15 per cent., and operating expenses perhaps 4 per cent. The result is a net gain (the increase in expenses affecting a smaller principal amount), and the experimentation is continued.

The average rate is then reduced by 12.50 per cent. to .700 cent per ton-mile. Only a limited amount of bargain-counter business is stimulated to movement, and the increase in traffic falls short of compensating for the loss in the average rate.

This can only mean that the .800 cent rate was reasonable. It was not so high as to impede the traffic movement, and this is demonstrated by the fact that a further reduction did not enlarge the volume to an appreciable extent.

Over and above the direct pecuniary advantage resulting from the judicious lowering of rates, there remains the tendency to develop the territory served, and so to aid in the upbuilding of commerce and industry as to lend stability to the traffic movement, and thus to conserve revenues.

Whether railroad transportation be a pure monopoly or a competitive industry, there is abundant reason for concluding that the rates of transportation will tend, by a process of natural gravitation, to the point where they are reasonable—subject, of course, to such anomalies as are liable to occur under any system of regulation, and which actually do occur under the existing system; and that in obedience to a law or laws whose operation is assured in the one case by mere considerations of self-interest, material and immediate, and in the other by the rigor of necessity itself. As a conclusion of logic, the evidence is convincing; historically, nothing appears in contradiction of it.

There is practical unanimity among modern political economists regarding the basis of a monopoly price.

". . . Under these circumstances (of falling demand under a high charge) the maximum gross income is obtained by making rates low enough to develop a good volume of traffic, instead of by raising them so high as to reduce that traffic to a small amount. If a concern uses a large amount of fixed capital, it will rarely happen that the most money can be made by a policy of high charges with small volumes of business. . . ." —Economics, Arthur T. Hadley, LL.D., Yale University, p. 161.

"Suppose now that the monopolized commodity is produced, not under the conditions of constant cost, but under those of diminishing cost (increasing returns). . . .

". . . Evidently the monopoly profit will be much greater with the lower price than with the higher price; this because the conditions assumed are those of very elastic demand and of rapidly decreasing cost. . . ." —Principles of Economics, F. W. Taussig, LL.D., Harvard University, Vol. I, pp. 205-6.

Further, with some qualification as to the manner in which the theory of monopoly price is apt to work out in practice:

". . . Managed as a private or purely money-making enterprise, it (a railway) will charge the general range of rates which will bring the maximum profit . . ."—Id., Vol. II, p. 395.

"If monopoly price is not influenced by marginal cost, is it affected by cost at all? Assuredly, but in a more indirect way than competitive price. Monopoly price is always at the point of maximum monopoly revenue. . . . Since increased supply ordinarily means lower price, he (the monopolist) will experiment until he finds the point of greatest net returns.

"If, however, the industry is subject to the law of increasing cost (diminishing returns), the maximum monopoly revenue will be reached at a higher price; if it is subject to the law of decreasing cost (increasing returns), it will be reached at a lower price. . . ."—Principles of Economics, E. R. A. Seligman, LL.D., Columbia University, pp. 256-7.

"The diminished cost of transport invariably augments the amount of commerce transacted, and in a much larger ratio than the reduction of cost . . .

"But if we suppose these circumstances to prevail in a country, such as certain districts of England, closely reticulated by railways, the increase in the market would be not in the simple ratio of the increased radius of transport, but in the ratio of its square, as has been explained generally in the first chapter of this volume."—Railway Economy, Dionysius Lardner, D. C. L., pp. 7 and 300; London, 1850.

This is the nexus: That the point to which the price of a monopolized product will gravitate, namely, that at which net profits are greatest, coincides with the point where transportation rates are reasonable, and so acknowledged by the users of transportation; for at this price they take all of the commodity that they require.

The real need of the business interests of this country, and the demand from them, was never so much for cheaper transportation as for the reasonable stability of transportation rates.

It is no doubt a national misfortune, which coming years promise to accentuate, that governmental steps were not taken at an early time to insure this stability. It is a condition which the railroads had sought at many times and in many ways to establish, but had failed; and is therefore a proper function of government. If to this an effective publicity had been added, there is a two-fold reason for concluding that much misdirected effort, in part at least negative in its consequences, might probably have been avoided.

It may be that we as a nation shall discover that, in the process of correcting evils which undoubtedly called for correction, we have gone too far, undertaken to regulate that which requires no regulation and had best be left to the operation of natural law; that in our eagerness to bestow public benefactions, we have not scrupled to do so at private expense, without perceiving their predestined failure to inure to the permanent advantage of the supposed beneficiaries; and that we shall find it necessary to retrace our steps and establish ourselves on more rational and enduring foundations.

REDUCED FARES FOR STANDING PASSENGERS ON A GERMAN STREET RAILWAY.—There is a German street car line running cars between cities in Rhenish Prussia, which charges only about half the regular passenger fare to those who stand. The plan is so devised that a passenger may choose to be a strap hanger. That is, if every seat in the car is vacant, he may still stand and ride at half fare. We can imagine how such an idea might work in this country.

Simplifying the Tonnage Rating Problem

Details of a Method Which Has Been in Constant Use for Four Years on an Important Trunk Line

By R. S. Mounce

The problem of freight train tonnage rating is probably handled in as many different ways as there are railways. Any method, to be entirely satisfactory, must have the following characteristics:

1. Ease of application. A minimum amount of time should be required in making up trains, and there should be no calculations left to be made by the yard forces except the necessary addition of gross car weights and a constant allowance for car friction.

2. Accuracy. The rating should be so devised that there will be no liability to underload the locomotive, thereby losing the benefit of a certain amount of hauling capacity, nor to overloading, which will cause delays on the road. In either case there will be a loss of efficiency in freight movement.

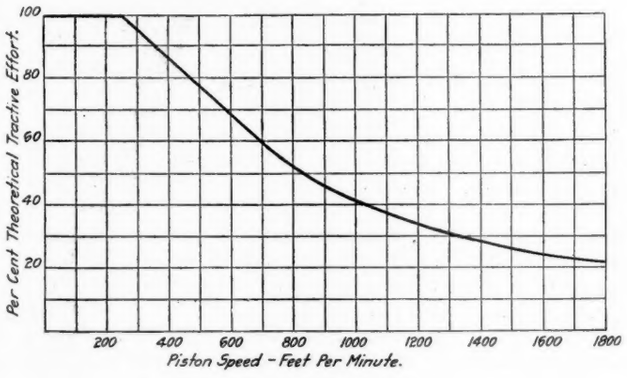


Fig. 1—Speed Factors

3. Flexibility. The allowance for car friction should be a constant quantity, of such a value that it will properly equate any combination of car weights entering into the make-up of the train.

The method of tonnage rating which will be explained in some detail in this article, has been in constant use on one of the large trunk line railways for about four years. Tests were conducted at the outset to prove the accuracy of the calculations, and continued application of the method has given entirely satisfactory results.

The writer has based all calculations on a heavy Mikado type locomotive, which is suitable for ordinary drag freight or fast freight service. For drag freight service, 10 miles per hour has been taken for the speed over the ruling grade, and 15 and 20 miles per hour for fast freight service. The selection of the proper speed over the ruling grade depends upon the economical speed, or the schedule requirement, of the train over the entire division. The aim should, of course, be to secure the greatest efficiency of freight train movement at the lowest possible cost per ton-mile.

The results of the calculations are plotted in the form of curves, and it simply remains to determine the ruling grade on any particular division, in order to determine the maximum, or summer, rating for that class of locomotive over the division in question. The simplicity of the method lies in the fact that after the calculations are made for each class of locomotive for either drag or fast freight service or both, a curve can be plotted for each. This gives a permanent record in a small space and the ratings of all locomotives over each division can be determined without difficulty when the ruling grade is known.

METHOD OF RATING TONNAGE

I. *Internal resistance of the locomotive and tender.*—The loss of tractive effort (in pounds) in the locomotive and tender is found with sufficient accuracy by taking the sum of the three groups shown below:

A—Trucks and tender.

$(W_1 + W_2 + W_3) \times (2 + V \div 4)$

In which W_1 = weight on engine truck, tons.
W_2 = weight on trailer truck, tons.
W_3 = weight of tender (loaded), tons.
V = speed, miles per hour.

B—Drivers.

$W_4 \times 20$

In which W_4 = weight on drivers, tons.

C—Grade.

$W_5 \times 20 \times g$

In which W_5 = total loaded weight of locomotive and tender, tons.
g = grade, per cent.

II. *Theoretical tractive effort.*—The amount of decrease in theoretical tractive effort due to an increase in speed is shown by the curve in Fig. 1. This curve shows the per cent. of theoretical tractive effort, or the speed factor, corresponding to various piston speeds. It is taken from the American Locomotive Company's train resistance bulletin, No. 1001. The piston speed (ft. per min.) in terms of speed in miles per hour is obtained by the formula:

Piston speed = 56 x M.P.H. x S ÷ D

Where S = piston stroke, in inches.
D = diameter of drivers, in inches.

From this curve the speed factor can be readily obtained. The theoretical tractive effort is found by multiplying the calculated maximum tractive effort by the speed factor.

III. *Available tractive effort.*—This is the force which is available for actual work in hauling the train. It is found by subtracting the internal resistance of the locomotive and tender from the theoretical tractive effort and taking 90 per cent. of the difference. This 10 per cent. reduction takes care of certain variables, such as head wind resistance, slippery rails, locomotive

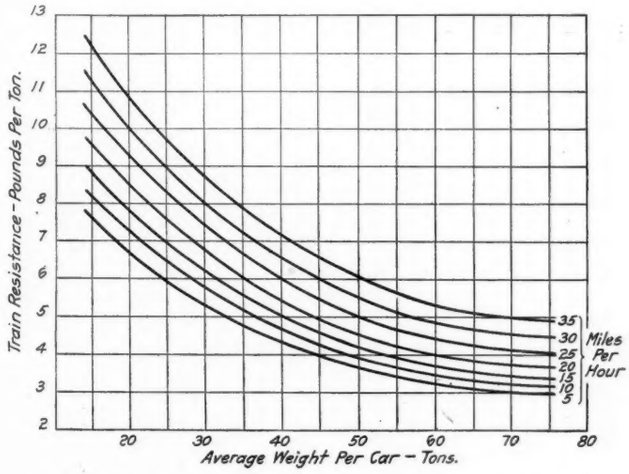


Fig. 2—Relation Between Resistance and Average Car Weight at Various Speeds

near the repair period, etc., any one or more of which is likely to be met. It has been found by experience that 10 per cent. is a fair allowance for these variables, and it saves some involved and more or less uncertain calculations.

IV. *Train loads.*—The results of the train resistance tests conducted under the direction of Prof. E. C. Schmidt, of the University of Illinois, and printed in the Master Mechanics' Association proceedings for 1910, are universally recognized as the standard upon which to base freight train tonnage rating calculations. Fig. 2 is reproduced from that report, and from it the train resistance per ton for various weights of cars at different speeds can be readily taken. Grade resistance per ton equals 20 times the per cent. of grade (including .05 per cent. per degree of curvature, if uncompenasted for curvature). The train load is found for a train made up of all-heavy cars (70 tons gross weight) and for one made up of all-light cars (20 tons gross weight) by dividing the available tractive effort by the sum of

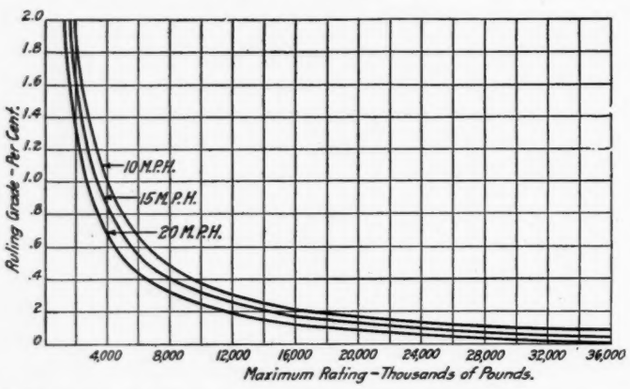


Fig. 3—Freight Train Tonnage Rating for Class N-3 Locomotive

the grade and train resistance per ton for each of the classes of cars selected. This gives the weights, in tons, of a train of 70-ton cars and a train of 20-ton cars. Dividing the train weights by 70 and 20 respectively gives the number of cars in each train.

V. *Car factor.*—The car factor is a figure introduced in the equated system of tonnage rating for the purpose of equating the weight of the train to the number of cars in the train and the available tractive effort of the locomotive. It is found by dividing the difference between the weights of a 70-ton car train and a 20-ton car train by the difference between the number of cars in each train. The correctness of this method of obtaining the car factor may be proved by obtaining the train weight for any constant weight of car as outlined above (section IV). Add to

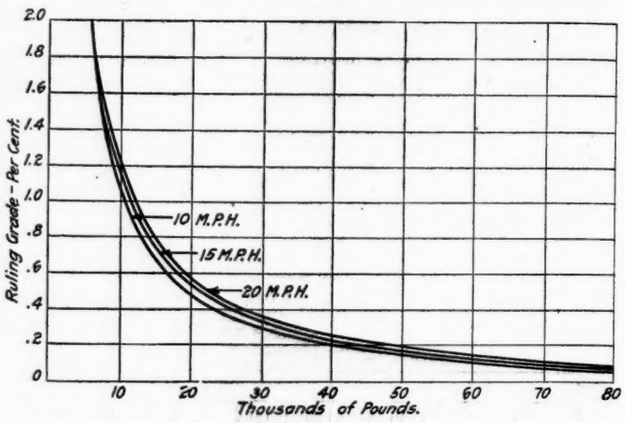


Fig. 4—Car Factor Corresponding to Fig. 3

this the product of the car factor and the number of cars. The sum will be a quantity which is constant within a fraction of one per cent. for any number of trains made up of cars of the same weight.

VI. *Tonnage rating.*—Using the results obtained as outlined in sections IV and V, and expressing the various weights in thousands of pounds, add to the train weight of 70-ton cars the product of the number of cars in the train and the car factor. The sum equals the tonnage rating for the given locomotive over a division having the ruling grade used in the calculations. This result may be checked by obtaining the rating from the 20-ton car data. The two figures will agree very closely.

VII. *Sample calculations.*—Data:

Ruling grade	.4 per cent.
Speed over ruling grade	10 m. p. h.
Locomotive (Class N-3)	
Type	2-8-2
Cylinders	28 in. x 32 in.
Diameter of drivers	63 in.

Table I.—Tonnage Rating Data for Class N-3 Locomotive

Speed in miles per hour	10	15	20
Piston speed (from Fig. 1)	284	427	569
Speed factor (from Fig. 1)	.96	.84	.71
Theoretical tractive effort	55,200	48,300	40,825

Ruling grade, per cent.	Internal resistance, lb.	Available tractive effort, lb.	70-ton cars: Train load, tons	70-ton cars: No. of cars	20-ton cars: Train load, tons	20-ton cars: No. of cars	Maximum rating, thousands of pounds	Car factor
10 M. P. H.								
.1	3,414	46,607	8,877	127	5,039	252	25,475	61
.2	3,898	46,172	6,368	91	4,104	205	16,390	40
.3	4,383	45,735	4,944	71	3,451	173	11,930	29
.4	4,867	45,300	4,026	58	2,970	149	9,370	23
.6	5,836	44,428	2,913	42	2,308	115	6,475	16
.8	6,805	43,556	2,263	32	1,873	94	4,955	13
1.0	7,775	42,683	1,836	26	1,566	78	3,920	10
1.2	8,744	41,810	1,534	22	1,338	67	3,275	9
1.6	10,682	40,066	1,137	16	1,021	51	2,390	7
2.0	12,620	38,322	886	13	811	41	1,860	6
15 M. P. H.								
.1	3,568	40,259	7,385	106	4,096	205	21,750	66
.2	4,052	39,823	5,345	76	3,366	168	13,955	43
.3	4,537	39,387	4,168	60	2,848	142	10,250	32
.4	5,021	38,951	3,402	49	2,461	123	8,100	26
.6	5,990	38,079	2,465	35	1,920	96	5,565	18
.8	6,959	37,207	1,913	27	1,561	78	4,210	14
1.0	7,929	36,334	1,549	22	1,305	65	3,330	11
1.2	8,898	35,462	1,292	18	1,114	56	2,740	9
1.6	10,836	33,718	951	14	846	42	1,990	7
2.0	12,774	31,973	736	11	668	33	1,535	6
20 M. P. H.								
.1	3,723	33,392	5,807	83	3,180	159	17,331	69
.2	4,209	32,954	4,252	61	2,636	132	11,230	45
.3	4,692	32,520	3,335	48	2,243	112	8,300	34
.4	5,176	32,084	2,731	39	1,944	97	6,510	27
.6	6,145	31,212	1,982	28	1,523	76	4,495	19
.8	7,114	30,340	1,536	22	1,238	62	3,400	15
1.0	8,084	29,467	1,241	18	1,034	52	2,695	12
1.2	9,053	28,595	1,030	15	879	44	2,205	10
1.6	10,991	26,851	751	11	663	33	1,590	8
2.0	12,929	25,106	574	8	518	26	1,190	6

Boiler pressure	170 lb.
Maximum tractive effort	57,500 lb.
Weight on drivers	237,150 lb.
Weight on engine truck	29,600 lb.
Weight on trailer truck	53,850 lb.
Weight of tender (loaded)	163,970 lb.
Weight of locomotive and tender (loaded)	484,570 lb.

Internal resistance of locomotive and tender:

$$\text{Trucks and tender, } \frac{29600 + 53850 + 163970}{2000} \times 2 + 10 \div 4) = 557 \text{ lb.}$$

$$\text{Drivers, } \frac{237150}{2000} \times 20 = 2372 \text{ lb}$$

$$\text{Grade, } \frac{484570}{2000} \times 20 \times .4 = 1938 \text{ lb.}$$

Total, 4867 lb.

Theoretical tractive effort:

Speed factor corresponding to 10 miles per hour = .96.

Theoretical tractive effort = 57,500 x .96 = 55,200 lb.

Available tractive effort:

(55,200 — 4,867) x .9 = 45,300 lb.

Train loads:

Grade resistance = 20 x g = 20 x .4 = 8 lb. per ton.

Train resistance (see Fig. 2) at 10 miles per hour,

for 70-ton cars = 3.25 lb. per ton.

for 20-ton cars = 7.25 lb. per ton.

Train load, 70-ton cars:

$$\frac{45300}{8 + 3.25} = 4026 \text{ tons (58 cars).}$$

Train load, 20-ton cars:

$$\frac{45300}{8 + 7.25} = 2970 \text{ tons (149 cars).}$$

Car factor:

$$\frac{4026 - 2970}{149 - 58} = 11.58 \text{ tons, or say 23,000 lb.}$$

Tonnage rating:

Using 70-ton car data:

(4026 x 2) + (58 x 23) = 9,386,000 lb. (4693 tons).

Using 20-ton car data:

(2970 x 2) + (149 x 23) = 9,367,000 lb. (4683 tons).

Averaging and taking a round number gives 9,370,000 lb. as the rating for the locomotive on a .4 per cent ruling grade for drag freight service. (Note that the variation between the two figures above is 19 in nearly 9,400 or about .2 per cent. This checks the accuracy of the car factor as an allowance for friction.) Table 1 gives all the data for the class N-3 locomotive, calculated for grades ranging from .1 per cent. to 2 per cent., and at speeds of 10, 15 and 20 miles per hour. This data is plotted in graphic form in Figs. 3 and 4.

Some interesting facts are clearly brought out by the data. As the grade increases, the ratio of train resistance to total resistance decreases, and the train loads for 70 and 20-ton cars approach each other in value. This explains why the car factor is smaller on the heavier grades.

The fact that train resistance (or in other words, journal friction) plays such an important part on low grades, shows that a much heavier train load can be handled by using large capacity rather than small capacity cars, the difference being about 50 per cent. on a .2 per cent. grade. This means shorter trains, with the many advantages resulting from their use.

The car factor varies but little with an increase of speed over the ruling grade, and for all practical purposes the factor calculated for 20 miles per hour may be used at all speeds. In this connection it should also be noted that for a given speed and ruling grade, the car factor is constant for all types and sizes of locomotives.

INSTRUCTIONS REGARDING TONNAGE RATING

Typical tonnage rating instructions used on the railway referred to, and based on the methods of calculation outlined previously, are given below. Rating *A* is the maximum, or summer rating, and ratings *B, C, D, E* and *F* are approximately 5, 10, 15, 20 and 25 per cent. less than the maximum rating:

To obtain the rating for a locomotive add to the actual gross weight in Ms (thousands of pounds) of each car the car factor shown until the total equals the number of thousands of pounds shown as the rating for the locomotive in question. In all cases count cabooses as one car, also add another car to the train when the rating is a fraction of a car less than the full rating. The actual weights of cabooses are to be shown as follows:

Four-wheel cabooses	17,000 lb.
Eight-wheel cabooses	25,000 lb.

To obtain the rating for a train handled by more than one locomotive, add together the ratings for each locomotive used and then proceed as outlined above.

Rating *A* will be used for trains unless otherwise specified.

Rating *B* will be used when the temperature drops so as to warrant a reduction in tonnage as specified by the superintendent.

Rating *C* will be used if the temperature is between 33 and 23 degrees Fahrenheit; rating *D* will be used when the temperature is between 23 and 13 degrees; rating *E* will be used when the temperature is between 13 and 3 degrees, and rating *F* will be used when the temperature is below 3 degrees above zero.

RATING IN THOUSANDS OF POUNDS FOR ORDINARY TRAINS BETWEEN OLDTOWN JUNCTION AND WALDEN

Eastbound

Car factor 29— Rating	A	B	C	D	E	F
Class N-3	11,900	11,300	10,700	10,100	9,500	9,000
Class H-23	10,500	10,000	9,400	8,900	8,400	7,900
Class H-24	11,000	10,450	9,900	9,350	8,800	8,250
Class K-5	9,600	9,100	8,650	8,150	7,700	7,200

Westbound

Car factor 40— Rating	A	B	C	D	E	F
Class N-3	16,400	15,600	14,750	13,950	13,100	12,300
Class H-23	14,500	13,775	13,050	12,325	11,600	10,875
Class H-24	15,200	14,450	13,700	12,900	12,150	11,400
Class K-5	13,200	12,550	11,900	11,200	10,550	9,900

RATING IN THOUSANDS OF POUNDS FOR FAST FREIGHT TRAINS BETWEEN OLDTOWN JUNCTION AND WALDEN

Eastbound

Car factor 34— Rating	A	B	C	D	E	F
Class N-3	8,300	7,875	7,475	7,050	6,650	6,225
Class H-23	8,000	7,600	7,200	6,800	6,400	6,000
Class K-5	6,700	6,375	6,025	5,700	5,350	5,025

Westbound

Car factor 45— Rating	A	B	C	D	E	F
Class N-3	11,200	10,650	10,075	9,525	8,950	8,400
Class H-23	9,900	9,400	8,900	8,425	7,925	7,425
Class K-5	9,000	8,550	8,100	7,650	7,200	6,750

RAILWAY CONSTRUCTION IN COLOMBIA.—The Colombian Minister of Public Works has recently granted a concession for the construction of a railway from a point on the coast near Rio Hacha, in the eastern part of Colombia, to Barrancas, about 60 miles inland. The road is to be of meter gage with a maximum grade of 2 per cent. The contractor will have the right to about 320 acres of public land per mile, and in return his road is to carry the mails and the police with their prisoners free and government troops at half the regular rates. Provision is also included in the concession whereby no loan can be made with the railroad as guaranty without the consent of the government. The latter retains the privilege of purchasing the line at the end of 15 years, the average of the five previous years' income to be considered as 7 per cent. of the price which the government must pay. At the end of 50 years, however, the line becomes automatically the government's property. In addition to the railway, piers and a breakwater must be constructed at a place the contractor may select for a port. Both the road and the piers must be completed within six years.

THE RATE ADVANCE HEARINGS

At the opening on February 19 of the hearing of protests against the proposed higher rates on plaster Commissioner Harlan made the following statement:

The action of the commission on Monday last in further suspending, until September 12, the proposed increased rates involved in this case seems to have been misunderstood by those not familiar with the practices of the commission. It may be well, therefore, for me to say that the order then entered has no significance beyond the fact that the case is not yet ready for decision. Recognizing the public importance of an early disposition of the problems before us here, the carriers, shippers, and the commission are using every effort to bring the inquiry to an early conclusion, and there is reason to think the record on the main issues in the case may be closed and the arguments had in time to enable the commission to dispose of those questions before the summer recess.

There is another matter that I wish to speak of this morning, and in order that it may be clearly understood by those who have not been able to follow the progress of our hearings, it may be well again to explain that the commission has before it here two subjects of inquiry, namely:

(a) Are the present revenues of the carriers adequate?

(b) If not, how may they be supplemented?

With respect to the first of these issues, the carriers have already offered much testimony, but their witnesses have not been cross-examined, nor have the investigations by the commission on that question been completed. We are also advised that certain shipping interests will submit important testimony touching the adequacy of the present revenues of the carriers. In aid of an understanding of the first question and of a proper solution of the second question, the commission, as I explained at a recent hearing, has also addressed certain inquiries to the carriers which they have not yet been able fully to answer. Pending the preparation by the railroads of their replies, we have been hearing the protests of shippers against the proposed increases in the rates on certain particular commodities in which they deal or are otherwise interested. A hearing was also had on February 12, 13 and 14 regarding the propriety of a charge by carriers for certain special services that are now performed by them without charge in addition to the published rate. At that hearing testimony was offered by the railroads and large shippers regarding the following free services:

1. Trap or ferry car service.
2. Placing cars for loading or unloading on sidings serving industries.
3. Free lighterage.
4. Tunnel deliveries in Chicago.
5. Storage free and at unremunerative rates.
6. Reconsignments and diversions in transit.
7. Free holding of equipment under load at New York terminals beyond the customary free time allowed at other terminals.

A hearing will be had in Washington on February 27 and 28 to consider further the question of making a charge for spotting cars for loading and unloading on private spur and side tracks, for the trap or ferry car service, and for the tunnel and lighterage services in Chicago. It is expected that the final arguments upon these subjects will be had before the full commission at Washington on March 16 and 17.

Our records disclose that there are some 25,000 private spur tracks and sidings in the territory east of the Mississippi river, and, manifestly, it is neither desirable nor possible to examine in detail each one of these operations. But typical examples of the different classes of private spur and switch tracks will be helpful in enabling the commission to determine:

1. The propriety of a charge by carriers, in addition to the rate, for the spotting and trap car service.

2. The amount of the charge and the manner in which it should be assessed.

While the general conditions in this regard at Chicago were outlined at the recent hearing, further testimony is desired, and the commercial interests of Chicago that have already participated in these proceedings and others that desire to do so, are requested to come together promptly in conference among themselves in order that at the approaching hearing the commission may have further details respecting private spur and switch tracks by means of illustrative cases. The commercial interests of Detroit, Cincinnati and Indianapolis are also requested to come together in conference in order that they may be represented at the next hearing by witnesses who will be able, by means of illustrative cases, to advise the commission of the conditions existing at those places. So far as the time permits representatives of other cities will be heard; valuable testimony has already been given bearing upon the situation at Buffalo. The commission will itself undertake, through its examiners, to make an appropriate record of conditions at smaller towns and villages in the territory involved.

The conditions developed in this way in respect of these matters at Chicago, Cincinnati, Detroit, Buffalo and Indianapolis, together with a report of typical spur-track conditions in villages, towns and the country districts, will probably be sufficiently illustrative as to give the commission a broad view of the general conditions in this regard throughout the territory east of the Mississippi river.

At the hearing on February 27 and 28 none of the services to and from and within industrial plants of the general character described in the Industrial Railways Case will be further considered. But throughout the territory the spotting service is performed by the carriers to coal yards, lumber yards, elevators, warehouses and factories, by placing cars for loading and unloading at particular points on the private spur tracks leading to them, in accordance with the requirements of the shipper. There are some complex spur track situations, properly coming within the scope of the hearing, such as the spur tracks of Larkin & Company at Buffalo, fully described at the hearing of February 14. There, as it appeared, four spur tracks extend into a large storage warehouse of that company, on the ground floor of which are the loading and unloading platforms. Each of these tracks will accommodate 15 cars. One is used exclusively for inbound freight, the other three being used for loading outbound freight. The tracks are drawn by the carriers at a definite hour every morning, after which they are again filled with empty cars. For the purposes of the hearing this and similar situations are not to be regarded as industrial plant railways, but simply as private spur and switch tracks. Less complicated examples of private spur tracks are to be found throughout this territory, including the simplest form in the small villages and in the country districts. Illustrative cases of these various classes of tracks, upon which the carriers perform the free spotting service, will afford the commission an ample record upon which to set for argument the question of the propriety of an adequate charge by the carriers for the service.

Information is also desired at the hearing as to what the amount of the charge should be, if any is to be imposed. The suggestions already made to the commission range from 50 cents a car, in cases where the operation is simple, the spur track short and the district not congested, to $2.50 a car in cases where congestion exists and the service is extensive. The commission desires to be fully advised at the hearing on this point.

The matter of making a charge for placing cars for loading on spur tracks leading to coal mines and coke ovens will be taken up for consideration as a separate matter, and March 4 and 5 have been reserved for hearing testimony on this subject. At this time testimony will also be heard touching the propriety of the cancellation by carriers of allowances

and divisions to the industrial roads of coal companies and operators.

March 6 and 7 have been reserved for hearing testimony respecting the proposed increase in coal rates, and March 9, 10 and 11 have been set aside for hearing testimony upon the general objections to the proposed general increase in rates, and particularly for hearing representatives of the state railroad commissions.

That part of the case that pertains to the proposed increases in the lake-and-rail rates will be heard at Washington on March 12, 13 and 14.

Separate hearings will be assigned later to consider lighterage and other special services at New York City and New York Harbor, and concerning reconsignments and diversions in transit, free storage, etc.

On February 20 Commissioner Harlan heard the arguments of lumber shippers against the proposed 5 per cent. increase in all rates in official classification territory. The principal witness for the lumber men was John R. Walker, president of the Lumbermen's Bureau and representing the Southern Hardwood Manufacturers' Association.

Mr. Walker said that 70 per cent. of the products manufactured from lumber are manufactured east of the Rocky mountains and south of the Ohio river, and that the greater part of these manufactured articles move through the Ohio river gateways and Virginia cities to be marketed in the northeastern states. He estimated that the proposed advance would mean an additional one cent per 100 lb. on the through rate, or an advance of 40 cents per 1,000 ft., and that if this advance were passed along to the consumer in the way that it is ordinarily done it would increase the price by 60 cents per 1,000 ft. Mr. Walker said that in his opinion not only would the southern roads advance the through rate the full amount of the 5 per cent. increase in the official classification territory part of the rate, but that it would only be a question of a short time until the southern roads also asked for an advance in rates.

Mr. Walker made a special plea against the raising of rates on lumber on the ground that lumber production was continually becoming more expensive, while there was keen competition in the market for lumber products because of the introduction of substitute materials in car building, household furniture, interior finish and in construction materials generally. He made the point that the haul on such articles was shorter than on lumber and that an increase in the rate on lumber would lessen this traffic and would therefore tend to lower the total amount received by the railroads and would defeat the purposes of the 5 per cent. increase for which the carriers are asking.

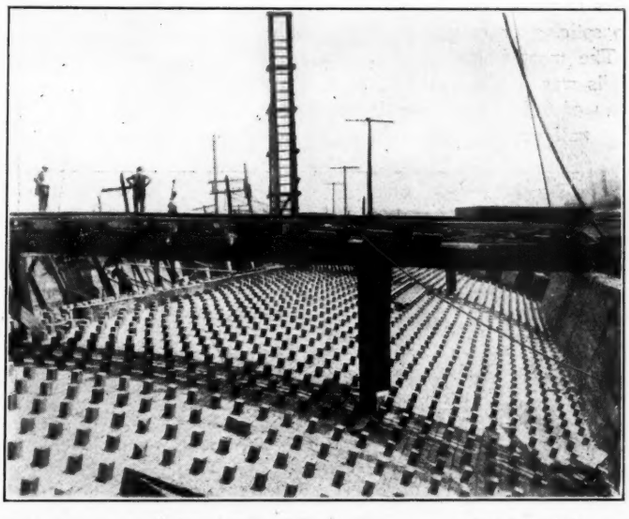
Mr. Walker said that as evidence of the extent to which lumber is being displaced by other materials, out of recent specifications for 30,000 new cars by railroads the specifications for only 2,000 cars called for lumber in connection with their construction. Mr. Walker said that in his opinion the present lumber rates prohibit the marketing of at least 50 per cent. of the standing timber, which is of too low a grade or too small in size to make it profitable to cut and ship under the existing transportation rates. If, on the other hand, the present rates on lumber were reduced 10 per cent., Mr. Walker estimated that not only would the roads not lose, but that they would actually gain in revenue because of the very large increase in tonnage that would result. Mr. Walker said that he thought that the opening of the Panama canal would materially change the present lumber routing situation and would be likely to take away from the north and south railroads a large tonnage of lumber now hauled from the southern states to the northern Atlantic seaboard cities. Mr. Walker thought that the Interstate Commerce Commission should make a recommendation to Congress favoring a law which would permit pooling.

On cross examination Mr. Walker suggested that one way of preventing organized labor from going on indefinitely in demanding and obtaining higher wages was to inaugurate some form of profit sharing such as is provided in by certain large manufacturers.

Joseph E. Stark, a manufacturer and wholesaler of lumber, flooring and cooperage stock at Memphis, Tenn., told at some length of the competition of foreign woods, especially Japanese oak, and under cross examination acknowledged that he would strongly object to a charge for spotting cars at his place of business.

GRADE SEPARATION IN McKEES ROCKS, PA.

The Pennsylvania Lines West and the Pittsburgh & Lake Erie own jointly the Pittsburgh, Chartiers and Youghiogheny Railway, operating a single track connection between these two roads and passing through the borough of McKees Rocks, about five miles down the Ohio river from Pittsburgh. In April, 1910, the reconstruction of this line, including the separation of all grades through the borough and the building of a double track between "DJ" tower on the Pennsylvania and McKees Rocks yards of the Pittsburgh & Lake Erie, was begun. This improvement was made to facilitate the handling of the increasing interchange business between these two roads in addition to the local traffic from the steel mills located along the line, which includes a very large part of the business of the Pressed Steel Car Company's plant. Preliminary studies for this work had brought out the fact that it would be necessary



Extrados of Arch Ring Showing Arrangement of Bricks to Secure Bend to Concrete Backing

to build a considerable length of retaining walls as the right of way was narrow and the property values were very high.

Comparative designs were prepared for reinforced and plain concrete retaining walls on this work, the result of this study being the adoption of mass walls. The cost of a mass wall was shown by the estimates to be less, and in addition to this the use of reinforced concrete with a long foundation toe on the inner side would have necessitated the abandoning or shifting of the operated track with considerable resulting interference to traffic and would also have made it impossible to build more than one wall at a time. The reinforced concrete section as designed in the preliminary study was 20 ft. high, with a top width of 18 in., the outer face being plumb. The foundation was to be supported on at least two rows of concrete piles made in place. The cross section of this wall was 84 sq. ft. Its cost per cubic yard was as follows:

Concrete in place	$9.00
Shifting tracks and extra filling	1.00
Extra piling	.15
Total	$10.15

A mass concrete wall designed for the same loadings and also founded on concrete piles with a top width of 24 in. for a

10 ft. height and 36 in. for a 20 ft. height having a back batter of 4½ in. was found to have a cross section of 160 sq. ft., and was estimated to cost $4.75 per cu. yd. Taking into account the difference in section between the two designs, the saving per cu. yd. of mass concrete over reinforced for this case was $0.65 per cubic yard, which is in addition to the advantage in favor of the mass design that traffic would not be interfered with in its construction. As the walls included about 12,000 cu. yds. of concrete, this saving was a very important one.

Very careful studies were made to determine what type of piling would be most economical for these wall foundations. The bids on different types of piles showed the following prices, all of the piles being 20 ft. long.

Kind of pile.	Spacing.	Bearing pressure.	Price per ft.
Concrete made in place.....	5 ft.	100 tons	$1.00
Concrete premoulded	3½ ft.	70 tons	2.50
Wood	2½ ft.	16 tons	.45

As it was required that the spacing be 5 ft., and the bearing pressure was limited to 70 tons, these prices had to be revised for the premoulded and wooden piles, the new price in the former case being $3.55, and in the latter, using four lines with a 2 ft. spacing, $3.60. This shows the made in place piles to be considerably cheaper. The depth to rock was not uniform and unless very exhaustive tests had been made, premoulded concrete piles would have had to be cut off in some cases in order to bring their tops within the foundation. By making the piles in place only the actual length needed had to be used and no splicing or cutting was necessary.

The most important difficulty encountered in building these walls was in the passing of an old brick arch sewer having a span of 6 ft. As it was impossible to carry the entire load of the wall on this old sewer, excavation was carried down on

Tops of "Made in Place" Concrete Piles Exposed to View

both sides 5 ft. wide to bed rock in order to insure a solid foundation for the wall at this point. Concrete benches were built up on each side and the brick arch was spanned by old 70 lb. rails bent to an arc with a 5 in. middle ordinate, the rails having a bearing on each bench of 18 in., and clearing the extrados of the sewer by 1⅞ in. The rails were spaced 24 in. center to center and supported a wall 20 ft. high. Each rail was calculated to take a load of 5½ tons, which would deflect the curve enough to bring it into contact with the extrados of the sewer arch and allow the arch to take the maximum load for which it was calculated.

In connection with the track elevation work a concrete arch over a street was built about a half mile from the retaining wall work. The design of this arch is somewhat different from standard practice. The arch ring is of vitrified brick with concrete backing and cut stone facing. The abutments and foundations are of concrete on wooden piles. The arch carries five tracks, has a span of 50 ft. and a rise of 7 ft. In order to secure a 14 ft. clearance for a car line, bench walls 7 ft. high were used. The intrados consist of one line of vitrified brick, the third brick in each third line being placed on end to form a bond with the concrete backing, as shown in one of the accompanying photographs.

The unit cost of concrete in this work was as follows:

	Per cu. yd.
For the arch completed.....	$7.98
Track raising on fill over the arch.....	.17
Engineering expenses	.14
Total	$8.59

	Per cu. yd.
Retaining walls complete.....	$6.29
Filling and track raising.....	1.00
Engineering expenses	.45
Total	$7.74

Universal Portland cement and Ohio river sand and gravel were used on all this work, the sand and gravel being obtained

Cribwork Along New Elevated Line

from one to two miles from the work. The cost of concrete materials was: cement, $1.17 per bbl.; sand, $0.60 per ton, and gravel, $0.80 per ton.

The filling between the retaining walls was handled by raising one track at a time and separating the high and low grades by crib work built up of old ties and rejected bridge timbers. Slag was user for filling, and in addition to the ease in handling this material and in lining tracks on it, it has proved an excellent foundation for a good roadbed. The slag was especially desirable in filling back of the walls and abutments, taking the place of crushed stone which is so often necessary to secure proper drainage. When the slag is deposited wet, cementing begins very rapidly and the embankment hardens very quickly.

This work was handled under the supervision of the engineering department of the Pennsylvania Lines West, T. L. Essick being in direct charge. We are indebted to Mr. Essick for the above information.

RAILWAY EXTENSIONS IN NEW SOUTH WALES.—The Minister of Works, replying to a deputation of citizens, has announced that it is intended to spend $7,500,000 on railway construction in New South Wales during the coming year. It is also expected that the government will soon take action towards bringing into operation a comprehensive scheme for the transportation of wheat in bulk, as suggested by Mr. Burrell, an American traffic specialist. The scheme includes the erection of a central elevator in Sydney, another at a northern port not specified, and a third at Jarvis Bay. In Australia grain is universally carried in bags.

I. C. C. ANNUAL REPORT ON SAFETY APPLIANCES

The Interstate Commerce Commission has issued a report by H. W. Belnap, chief inspector, dated December 1, giving a review of the work of the Safety Appliance Division during the year 1913. The field inspectors have examined nearly twice as many cars as in 1912. Railway officers inform each other when a government inspector may be expected, and in consequence, abnormal activity is found; but in spite of this "subterfuge" the policy of surprising the railroad inspectors will be continued. Explaining the tabular statements in the report, Mr. Belnap says:

"Defects to visible parts of air brakes constitute nearly 50 per cent. of the total number of defects reported. This is a condition which should not be permitted to exist. Practically 50 per cent. of the defects reported under the classification of 'uncoupling mechanism' consist in broken uncoupling chains. These chains may be quickly and readily repaired at any time and place, and the proportion of such defects to the total number of defects reported is inexcusable. The number of uncoupling devices which have no chain has greatly increased in recent years; their general adoption will effect a proportional diminution in the aggregate number of defects. The Master Car Builders' Association has acted with a view to the adoption of a standard coupler, and it is to be hoped that at its next convention it will recommend a standard.

"Under 'running boards,' out of a total of 6,912 defects reported, 4,265 consisted in loose braces. It has also been found in many instances that drive screws or fluted nails have been used to secure running boards to saddle blocks. The use of such material is clearly a violation of the standardization order of the commission, and should be discontinued.

"The principal defect, numerically, in the matter of hand-brake equipment continues to consist in the absence of the cotter key or ring from the bottom of the shaft. In most cases these keys seem never to have been applied. Hand brakes are frequently found inoperative by reason of shifting of the contents of cars. The act of April 14, 1910, requires all cars to be equipped with efficient hand brakes.

"The record of terminal or standing tests of air brakes made by our inspectors shows that there are a number of instances in which the percentage of operative air brakes has been found to be below the minimum of 85 per cent. prescribed by the commission's order of June 6, 1910. The importance of these tests as an element of safety cannot be overestimated. At many terminals the only air brake test made by the carriers consists merely in the ascertainment of whether or not the air is working throughout the train line. Such tests provide no adequate information as to the efficiency or otherwise of individual brakes, and trains are not infrequently permitted to leave their terminals with insufficient braking power. The interval of five or ten minutes necessary to make a standing test is scarcely to be counted in comparison with the proportional increase in the measure of safety resulting from such a precaution.

"The charge that our inspectors have delayed traffic by the making of terminal tests is not well founded, for the reason that such tests are invariably completed within a few minutes. The real occasion for delays to traffic has in most cases been the situation disclosed by such inspections. Our inspectors will hereafter make standing tests of every train that leaves a terminal while they are present. This may, of course, occasion slight delays to traffic, but the tests will be made as expeditiously as possible, and if the efficiency of individual brakes is maintained at a proper standard the time consumed in making tests will be inconsequential.

"The commission's standardization order was issued March 13, 1911. The period of limitation in which locomotives of all classes were to have been equipped comfortably to the provisions of this order has already expired, while the three-year period as to passenger equipment will expire on July 1, 1914. The progress in the equipment of passenger cars is such as to warrant the belief that the requirements of the commission in this respect will be observed within the time prescribed. The proportion of freight cars, however, already equipped, as compared with the total number of such cars to be equipped, is still unduly small, and unless this work of equipment is very materially expedited it will not be completed within the limit fixed by the extension order of March 13, 1911. I therefore renew my recommendation that the commission require the carriers to report semiannually the progress hereafter made in the equipment of freight cars in service on July 1, 1911.

"Inspectors are required not only to inspect safety appliances, to procure evidence to be used as the basis of prosecutions under the safety appliance act, and to attend court in the capacity of witnesses in such proceedings, but also to make terminal tests of air brakes; to examine locomotive ash pans; to inspect railway mail cars; to investigate accidents; to investigate and report on numerous informal complaints; and to confer with the mechanical officials of railways relative to the proper equipment of cars. The work performed by the various inspectors during the fiscal year just closed presents a creditable showing.

"At the present time there are in service approximately 2,250,000 freight cars, 58,000 passenger cars, and 63,000 locomotives subject to federal inspection, and in order to examine in any one year more than a very small percentage of the aggregate equipment it is obvious that the number of inspectors should be increased. It is therefore respectfully recommended that additional inspectors be appointed. . . ."

Table No. 1 shows that during the fiscal year 738,665 freight cars were inspected, of which 54,055 were found defective. The lists showing the items making up this total fill two pages.

Table No. 2 shows defects on each individual railroad, but includes only those roads on which 500 or more cars were inspected during the year, the defects being divided into 16 classes. This list contains the names of 135 roads.

Table No. 3 shows the names of 150 roads on which terminal tests of air brakes were made, the total number of trains tested being 1,040. The number of air cars in these trains was 29,637, of which 1,610 had brakes that did not apply. On 397 cars, brakes were found with excessive piston travel.

Table No. 4 shows, by roads, the number of cars inspected, and the number found defective, on 119 representative roads, each year for five years.

Table No. 5 shows the total amount of penalties, exclusive of costs, paid by the railroads into the courts up to November 1, 1913, for violations of the laws relating to safety appliances, to hours of service and to ashpans. This list contains 250 roads and the combined total of the penalties is $480,962. The length of time covered by this table is not given, but it is to be borne in mind that prosecutions under the safety appliance act began a number of years before the hours of service act went into effect. The totals under the different heads are as follows: Safety appliance act, $319,400; violations in working time of trainmen, $120,662; telegraph operators, $21,400; failure to file reports, $14,500; ashpan act, $5,000.

A NEW RAILROAD FOR THE DOMINICAN REPUBLIC.—It is reported that construction work has been begun upon a railroad in Dominica from Brahona to Neybo, and then along Lake Enriquillo to the Haitian frontier. The concession was granted by the Dominion congress on July 15, 1913, and work was to have been begun before January 12, 1914. This railway, the first important line in the southern half of the Dominican Republic, will open a new and undeveloped part of the country. It is planned to devote the country reached by the railroad to sugar and alfalfa, for both of which, it is believed, the deep, alluvial soil, with an ample supply of water for irrigation by gravity is well adapted. The railroad is authorized also to build a dock and maintain a service of boats on the lakes along the route.

NEW YORK RAILROAD CLUB; SIGNAL GLASS

The New York Railroad Club at its last regular meeting, February 20, listened to a paper by Dr. William Churchill, director of the optical laboratory of the Corning Glass Works, on signal glass.

Dr. Churchill gave an interesting review of the history of the development of glass, the different kinds of lenses and the different colors for railroad use. In 1869 the bulls-eye or plano-convex type was the universal glass. The development of glasses to suit modern railroad conditions has been a constant study requiring the work of experts in a number of different lines. To make glasses of a uniform color is still difficult. About 1899, the development of the long time burner and the introduction of yellow as a cautionary signal led to important improvements in glass. In the autumn of 1904, the Corning Glass Works developed the "optical" lens which since then has been the accepted standard for nearly all types of signal lamps. This lens makes an efficient signal light from a flame of only one candle power.

To illustrate the different designs of lenses, Dr. Churchill showed a large number of drawings on the screen, including Fresnel lenses and a late design called the "spreadlite." With this, it is possible to secure the effect of a Fresnel lens with a much more powerful beam on the axis than can be done with any cylindrical lens of corresponding size. The spreadlite has an extreme spread of nearly 35 degrees. In 1906, a Fresnel lens was made with a smooth outer face; and following this has come the spheroidal lens, now finding favor for tail lamps on trains, for switch lamps and for other purposes.

Dr. Churchill discussed colors at considerable length. The introduction of green for the proceed indication and yellow for caution has been followed by great improvements in colored lenses; and the adoption of standards by the Railway Signal Association in 1908 has led to the general use of uniform colors. Quite lately the "transmission" quality of green glass has been improved 35 per cent. without sacrificing any distinctness of color. Great improvements have been made in the quality of glasses for lantern globes and the breakage of globes by exposure to snow and rain has been reduced during the past ten years by 60 per cent., with a resultant saving of large sums of money. This glass is also used for battery jars and chimneys.

DISCUSSION

The discussion on Dr. Churchill's paper was participated in by A. H. Rudd, signal engineer of the Pennsylvania; J. M. Waldron, signal engineer on the Interborough Rapid Transit Company, New York City; H. S. Balliet, assistant manager of the Grand Central Terminal, New York City; R. C. Johnson, signal engineer of the New York Municipal Railways; C. H. Morrison, signal engineer of the New York, New Haven & Hartford, and others.

Mr. Rudd does not think that for semaphore signals there is need for a lamp to give greater spread. The optical lens is about the thing. Officers of his road have been slow to adopt green for the night proceed color, because the yellow glasses thus far furnished have not been looked upon as entirely satisfactory. He thought, however, that the new yellow glass exhibited by Dr. Churchill would probably prove satisfactory. This is a pale yellow which absorbs the violet end of the spectrum. This has been tried with high power headlights and largely eliminates the glare of such lights without impairing its usual range; and in fog or smoke it increases the range by reducing "back-glare." Mr. Rudd is planning signals for those portions of the Pennsylvania lines in and near Philadelphia on which electric traction is to be introduced, and he thinks likely that light signals, without movable parts, will be found satisfactory for those installations.

Mr. Morrison agreed with Mr. Rudd as to the hopeful prospect of finding light signals available for daylight service. Mr. Johnson intends to use light signals exclusively on his new lines in New York City.

Dr. Churchill, in closing the discussion, discussed light signals briefly, observing that extensive experiments would be needed to decide upon the most suitable size of lens and intensity of colors to meet the varied conditions which would be met with in using lights to give indications in sunlight, in cloudy days and under all conditions. Probably a 10-in. lens would be needed.

MASSACHUSETTS PUBLIC SERVICE COMMISSION

The Public Service Commission of Massachusetts, F. J. Macleod, chairman, has issued its first annual report, which embraces also the forty-fifth annual report of the railroad commission. The railroad commission went out of existence July 1, in accordance with the law which established the public service commission. The board was increased from three members to five, and now consists of Messrs. Macleod, G. W. Anderson, E. E. Stone, Clinton White and G. W. Bishop.

The report gives the usual statistical tables, and beyond this consists largely of matters dealing with telephones and other things formerly not under the jurisdiction of the railroad commission; and of railroad matters with which the readers of the *Railway Age Gazette* have been already made acquainted. On the general subject of railroad policy the report says:

"The Public Service Commission during the few months it has been in office has been obliged to deal with some of the most serious and difficult problems that have ever confronted a regulating commission in this commonwealth. But while there have been many important developments which have tended to make the railroad problem more acute during the past year, the essential features of the railroad situation are such as to make the discussion and recommendations contained in the forty-fourth annual report of the board of railroad commissioners, under the heading of 'Railroad Policy,' still pertinent. Most of the suggestions there made are still applicable and may well be considered by the legislature as in substance repeated at the present time. Attention should be directed to the fact that previous legislatures have had, not only in reports of the railroad commissioners, but in the reports of the joint board of 1909 and the validation commission of 1910, a most careful and thorough analysis of the railroad situation, together with fairly definite and specific recommendations, few of which have ever been acted upon by the legislature.

"The just feeling of dissatisfaction with existing conditions of transportation in this commonwealth, referred to in the last report of the railroad commissioners, continues. The destructive results of the policy of monopoly, waste and other forms of mismanagement have become most obvious in the decreasing market value of the securities of our leading railroads.

"The American people are now trying the experiment of having their great highways, the railroads, privately owned and managed and publicly regulated. That experiment is doomed to complete failure unless, as a joint result of management and regulation, the securities of these railroads are made and kept sufficiently secure and attractive so that new capital can readily and on fair terms be obtained for much needed extensions and improvements. The fact that the Boston & Maine is now paying no dividend, that the market price of the stock is less than $50 per share, that the New York, New Haven & Hartford has passed its last dividend, and that its stock is selling for much less than par, indicate the absolute need of an immediate and thorough reorganization.

"There is a vital distinction between regulation and management. The holders of the securities of our railroad properties should cherish no illusion that regulation is a substitute for efficient management. The directors of our railroads are chosen by the stockholders. While regulation may do much to protect the soundness of the investment, the sad experience of investors during the last few years shows conclusively that these stockholders must so exercise their franchise as to insure sound,

efficient, prudent, progressive management. Regulation may compel the correction of definite evils like the use of unsanitary cars, but regulation cannot make an inefficient business efficient. Regulation cannot convert a poorly managed railroad into a well managed railroad. Regulation cannot supply initiative or energy nor infuse into railroad executives a will to please the people. Regulation cannot overcome the anæmia or wasting sickness which attends monopoly. Regulation may curb but it can do little to develop the activity of railroad officials. It should be remembered also that there are jurisdictional limits to authority. Many problems can be solved only through the co-operation of our commission with the Interstate Commerce Commission and similar commissions of other states.

"The feasibility of co-operative action has been demonstrated in the recent conference had under the initiative of Commissioner Prouty on the proposition of the Boston & Maine to increase certain rates. Although the result is not, strictly speaking, an official adjudication upon the proposed increase of rates, this occurrence shows that speedy and concerted action between the national and state commissions is entirely feasible and that the technical difficulties growing out of our complex American system of conflicting national and state jurisdictions will not be found an insuperable barrier to efficient regulation.

"But no regulating commission can perform the functions of general manager and board of directors or supply the incentive and the eagerness to please the public and that development which results from the necessities of competition. Investors in the stocks of our railroads will neither have nor be entitled to have safe and generous returns upon their investments unless they so exercise their franchise as stockholders as to provide competent, efficient, progressive, faithful management.

"The public will no longer tolerate the spectacle of directors of our railroads trading with themselves, whether the transaction involves bankers' commissions for underwriting or marketing securities, or whether it involves a sale of railroads, trolleys or hotels. Our railroad companies will neither have nor be entitled to have public confidence until the directorates, without exception, recognize that it always takes two to make a real and honest bargain. Positions upon the directorates of our great railroad corporations must be regarded as positions of onerous responsibility. Men looking merely for places of easy honor and emolument or to cast votes for the benefit of express companies, car building companies or for the sake of granting special transportation privileges to some manufacturing interests, have no proper place upon these directorates. The insignificant stock holdings of many, perhaps most, of the directors of our leading railroad companies show how unrepresentative of the real ownership these directorates have become.

"What we have said as to the necessary limitations upon the power of regulation to protect investors is not to be construed too broadly. Under our capitalization laws permitting floating debt to be funded only when 'properly incurred for lawful purposes,' it is the plain duty of the regulating commission to scrutinize with care the nature and origin of every debt and by its orders to prevent the capitalization of any debt incurred for an improper expenditure or for the payment of dividends which are not clearly derived from real net earnings, that is, from earnings remaining after proper allowances have been made out of current or accumulated income for depreciation and obsolescence. In refusing to capitalize such expenditures the commission is safeguarding the interests of the stockholders. The greater the confidence of the investing public, the lower the rate at which it will furnish money for public utilities. Obviously, the lower capital charges may be kept, the lower may be the rates. It is the duty of investors in their own interest to guard against mismanagement as the attendant loss must inevitably, as recent events have shown, fall, in large part, upon the stockholders who, in contemplation of law, are responsible for the mismanagement. These considerations have a direct bearing upon the present situation. The holders of the securities of our Massachusetts railroads must in their own and in the public interest co-operate for an efficient reorganization.

"There is every expectation that the federal government will take proceedings under the Sherman anti-trust act to force a disintegration of the New Haven system, but such remedies as may reasonably suggest themselves should be applied through the *voluntary action of the company.*

"It is far better for the owners of securities as well as for the general public that the needed reorganization should be brought about by voluntary action, by fair consideration of both public and private needs and the requirements of the law, than that prolonged litigation should result. There is no confiscatory attitude in the public opinion of Massachusetts. Our people are ready and willing to pay just and fair rates upon property honestly and prudently invested in public utility companies.

"One main difficulty with the present situation is that it is impossible to determine how much of the present need of the companies is due to inefficiency or mismanagement for which the stockholders ought to be held responsible and how much is due to increased public demands and increased cost of furnishing the service. The burden, under ordinary conditions, is upon the owners of the securities to demonstrate the just needs of their companies; and this can only be done by showing what the net earnings of these companies will be if and when they have had a reasonable experience with the results of competent, faithful and efficient management.

"Of course this policy should not be pursued to the extreme of withholding from the companies such immediate increases of revenue as may seem just and reasonable. Any attempt, however, in the light of present conditions, to determine what additional revenue the Boston & Maine really needs and is justly entitled to have, can be little better than a guess. No one can say what the net earnings of the road would be if it had made a proper contract with the American Express Company and with the Pullman Company, had granted no undue favors to certain influential manufacturing interests, had provided with foresight and efficiency for a readjustment of its freight and passenger rates and had made, so far as necessary, seasonable application for authority therefor to the Interstate Commerce Commission and to the legislatures and commissions of the northern New England states.

"The Boston & Maine has for years borrowed the money it needed or raised it by the issue of stock, and has apparently given very little attention to the question as to whether its rates were as a whole just to its body of investors, or whether they bore any just relation each to the other.

"The conditions on the Boston & Maine indicate that the attention of railroad managers has been for some years insufficiently directed to the fundamental character of the problems with which they are dealing. Years ago a sound and efficient management would have dealt energetically with all these rate problems, including, of course, a proper adjustment of net earnings to depreciation and capital necessities. The initiation of new rates has always been the duty of the management, not of the regulating commissions."

The commission in conclusion says that a radical reorganization of the transportation system of Massachusetts is both desirable and inevitable, and continues:

(1) "The Boston & Maine and the New Haven systems should be at once separated and so separated that the B. & M. will be operated by a management having neither motive nor interest, direct or indirect, to serve any other railroad system or to divert for the benefit of any other railroad any traffic or profits which ought to accrue to its treasury. In a word the Boston & Maine should have a competent management entirely loyal to its stockholders and the community that it has to serve. It should be a northern New England railroad system. It should make such affiliations in northern New England with the great American and Canadian trunk lines as it finds most for its ad-

vantage and for the advantage of its community. It should make no affiliations or contracts with the New Haven road, the Pennsylvania or other southern trunk lines unless such affiliations appear to be reasonably demanded in the interest of the public or of the Boston & Maine.

(2) "We recommend that the Fitchburg division be retained as an integral part of the Boston & Maine, provided the two lines can be operated together on terms just and reasonable to the holders of the securities of both lines. The Fitchburg should compete for through western traffic with the Boston & Albany and other lines lying to the south of the Fitchburg. The so-called partnership contract between the New York Central and the New Haven with reference to the operation of the Boston and Albany on joint account should be terminated. We understand that steps have been taken for that termination. This recommendation is not to be understood as condemning proper traffic arrangements between the Boston & Albany and any other connecting line.

(3) "As to the trolley lines the public interest is best served by separate or independent management.

(4) "The so-called outside steamship lines from Boston should no longer be controlled by the New Haven. Wholesome competition between rail lines and water lines should be reestablished.

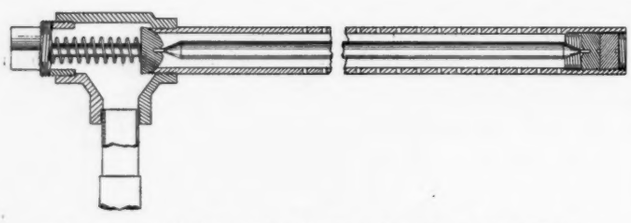
(5) "The continued control of the Sound lines is to be passed upon by the Interstate Commerce Commission. . . .

(6) "The Boston & Maine itself requires a radical reorganization. The equity of the stockholders hardly exceeds 20 per cent. of the capitalization of the entire system. Many, if not all, of the leased lines should have been consolidated with the parent company. Experience has shown that this leasing system has resulted in throwing an utterly disproportionate burden upon investors in the stock of the Boston & Maine. If it had been found possible to organize the Boston & Maine system by a consolidation of the various lines, owners of the stocks of the leased lines would have shared equitably in the fluctuations, risks, benefits and burdens of prosperity and adversity, good management and bad management. . . . Reorganization should be, in the main, a result of the agreements of the parties rather than through the compulsion of the courts or of the legislature. Receivership proceedings would inevitably cause great hardship. No attempt should be made to fund the outstanding floating debt, except to the extent already provided for, until there is a reorganization in accordance with the traditionally sound theories of Massachusetts railroad finance."

JOURNAL COOLER

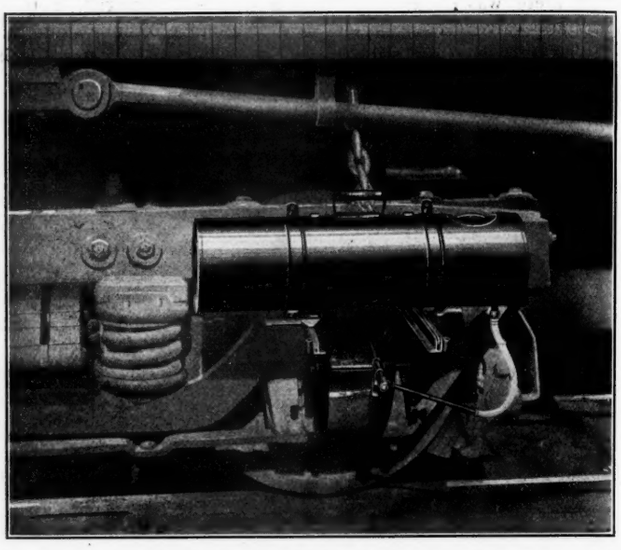
The hot box is always considered one of the necessary evils of railroad operation, but it will be generally admitted that there is much possibility of improvement in the methods of cooling journal boxes.

The B-J cooler, which is shown in the illustrations, was designed to overcome train delay. The cooler consists of a tank



Thermostatic Valve Which Controls the Flow of the Water

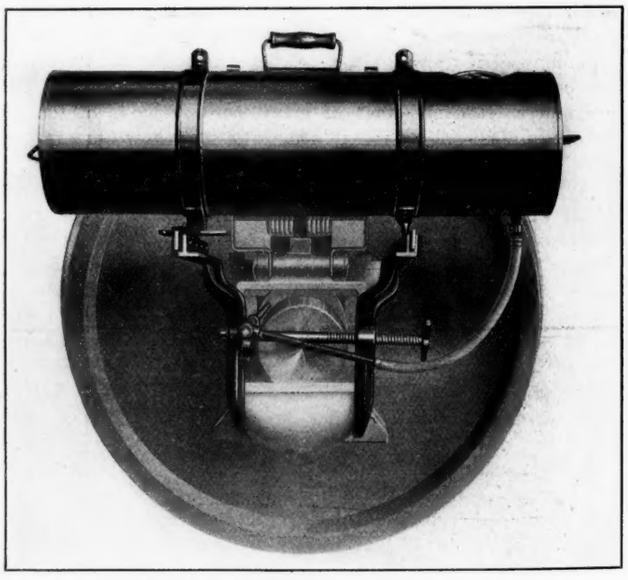
resting on two supports which are clamped to the journal box. Water from the tank is carried to the hot journal through a short hose and pipe connection, and is controlled by an automatic valve. When a journal becomes heated the tank is clamped to the box and the nozzle inserted on the rising side of the journal so that the water will tend to be carried up under the brass. This nozzle sprays the water as needed the full length of the hot journal, cooling it gradually. When the nozzle is placed in the hot journal box, the thermostatic element shown in the line engraving expands in the direction of its length, forcing back the feed valve and allowing free flow of the cooling agent to the spray pipe. This brings about a gradual uniform cooling of the journal and brass. With the cooling of the journal the



Cooler Applied to a Passenger Truck

thermostatic element gradually contracts, thereby reducing the flow until, when the box is at normal temperature the flow is practically stopped. It will thus be seen that the amount of water supplied to the journal is always proportionate to the degree to which the temperature of the journal is raised.

No running time need be lost in applying the cooler as it can be attached during a regular stop of two minutes. By feeding the water only as it is required there is no occasion to stop the



Method of Attaching the Cooler to a Journal Box

train in order to replenish the tank. Typical of the possibilities in actual service, the following is taken from a railway report:

After running 46 miles to the first stop of the train, the journal box was found to be heating. At the second stop, 30 miles farther on, the heat was increasing and at the next stop, 15

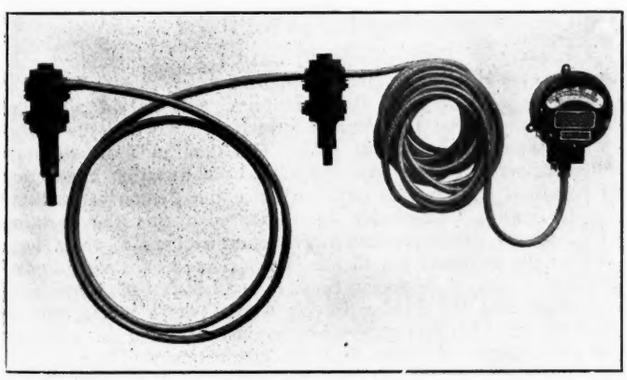
miles farther, the oil was boiling and splashing. The cooler, containing 7 gal. of water, was then applied. At the next stop, 41 miles farther on, the box was shown to be cooling, while at the next stop, 22 miles farther on, the box had been cooled to almost normal running temperature and the brass was found to be in good condition. Five quarts of water was added to the cooler and the box was repacked. At the next stop, 77 miles farther on, the box was found to be in good condition and there was little or no water passing through the thermostatic valve. The trip ended after another 60 miles, and the cooler was taken off, still containing a quantity of water which, when measured, showed that the journal had been cooled by using about three gallons.

This cooler is manufactured by the Transportation Utilities Company, 30 Church street, New York.

PYROMETER FOR SUPERHEATER LOCOMOTIVES

While it is true that remarkable economy results from the operation of locomotives equipped with superheaters, even when the best practices are not followed in handling them, the highest economy is obtained when the engines are given proper attention at the terminals and are carefully handled on the road. Whether the engines are receiving the care that they should at the roundhouses and are being efficiently operated on the road is best determined by the amount of superheat produced.

Recognizing the need of an indicator whereby the engineer could, at all times, be informed as to the temperature of the steam in the steam chest, attempts were made to find a suitable pyrometer for this purpose. Several instruments of both the pressure and electrical types were tested and found to be unsuited to the severe conditions under which they would have to operate. In order to get a satisfactory instrument for this purpose it was necessary to develop one that would meet the requirements established by the service in which it must operate. The conditions to be met were those of excessive vi-



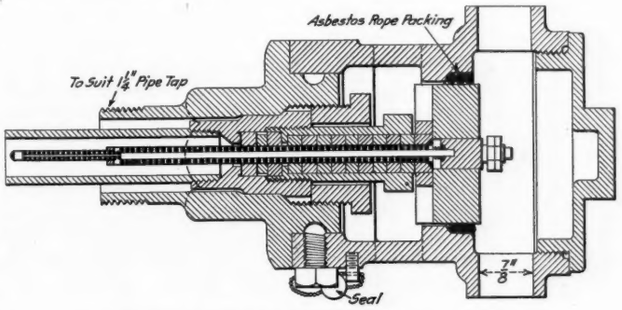
Arrangement of the Parts of the Pyrometer Apparatus

bration, varying temperatures and atmospheric conditions, as well as the rough handling to which devices on locomotives are subject. To meet these conditions required delicacy of adjustment and freedom of operation, combined with increased sizes of parts and durability of construction.

An instrument which has been developed to a satisfactory state is manufactured for the Locomotive Superheater Company, 30 Church street, New York, and is of the electrical type, consisting of thermo couples, constructed and arranged in accordance with the Bristol system. The cold end is located in the boiler, in the saturated steam, and the hot end in the steam chest, directly in the flow of the superheated steam. Electrical connections are established to an indicator of the milli-voltmeter type, located on the gage bracket in the cab.

The ends of the couples are so located that a variation of the outside temperatures has practically no effect upon them. The cold end of the couple, placed in the boiler in the saturated steam, is subject to only the slight variation in temperature due to the variation of the steam pressure, which does not vary more than a few pounds when the locomotive is in operation. The hot end of the couple, placed in the steam chest in the flow of superheated steam, is subjected to a range of temperatures from that of saturated steam to about 650 deg. The difference in electromotive force generated by the hot and cold ends of the couples is read directly in degrees Fahrenheit on the dial in the cab.

The electrical lead and extension between the couples and the



Section Through the Saturated Steam Fixture

instrument are designed to provide flexibility and the least amount of deterioration resulting from handling and bending. They are insulated with a specially prepared composition, which is affected by neither moisture nor temperature, and they are finally enclosed within a flexible bronze armor which prevents them from being bruised by substances falling on them.

The instrument itself is of the milli-voltmeter, double-jeweled Weston type, the movement having been very carefully designed from a standpoint of accuracy and lightness, in order that it may be depended upon to register accurately the extremely low electromotive force generated by the thermo couples. At the same time its construction is substantial enough to withstand the vibration and the temperature conditions to which it is subjected. The dial of the instrument is graduated to read directly in degrees Fahrenheit, and has a range of from 250 deg. to 750 deg. The pointer and graduations are carefully selected with the purpose in view of making them distinctly visible at all times, under the light conditions that prevail in a locomotive cab.

When a superheater locomotive is standing or drifting with the throttle closed, there is, of course, no superheat being obtained, and the indicating hand of the pyrometer instrument in the cab will be at the left hand side of the dial, reading between 350 and 390 deg., assuming that the boiler pressure carried is 200 lb. or less. As the throttle is opened and the engine starts to work, steam from the boiler passes through the superheater pipes and the superheating process begins. As the engine starts, the pointer will move from left to right on the scale, showing an increased temperature in the steam chest and as the engine is worked harder the superheat added to the steam increases until, under average conditions, the indicator registers between 600 and 650 deg.

When the pyrometer operates in this manner, it is an indication to the engineman that the locomotive is being handled so that the maximum saving that the superheater makes available is being obtained. If it fails to operate in this manner, it shows him that either the locomotive is not being operated to produce the best results or that it has not received the proper attention at the roundhouse.

RAILWAY CONSTRUCTION IN FIJI.—It is reported that the Fijian government has under consideration a scheme for the construction of 50 miles of railway from Suva up the Rena valley. The cost of the work will approximate $1,000,000.

General News Department

The Minneapolis, St. Paul & Sault Ste. Marie has announced that beginning April 1, its passenger trains will use the Baltimore & Ohio station in Chicago, instead of the Illinois Central station.

Salt Lake City has adopted an ordinance for the regulation of the smoke nuisance which provides penalties for excessive smoke and creates a smoke inspection bureau of one chief inspector and three inspectors.

The Minneapolis & St. Louis has notified the Postmaster General that unless payment is to be made for the increased weight of mails now thrown upon that road by reason of the parcel post, the company will avail itself of its legal right to refuse to carry the mails.

Second Assistant Postmaster General Stewart has compiled statistics designed to show that the railroads are wrong in saying that they are underpaid for carrying the mails. The Postmaster General has asked Congress to modify the law so as to make the carriage of mails by the railroads compulsory.

It is given out at Washington that vessels will pass through the Panama Canal by July 1; but the formal opening for traffic will not be before January 1, 1915. Railroads interested in transcontinental freight are considering the question of making reductions in tariffs, to take effect whenever the canal is opened for traffic.

Southbound passenger train No. 1 of the Queen & Crescent was stopped by robbers near Attalla, Ala., on the night of February 19, and all of the registered mail was taken from the mail car. One postal clerk who resisted the robbers was stabbed. The mail and express cars were detached from the train and run a considerable distance forward; and the passengers were not molested.

Disastrous and unprecedented floods in southern California last week blocked railroad traffic on many lines for four days and longer. On the Atchison, Topeka & Santa Fe, two passenger trains carrying 300 passengers were surrounded by water for three days or more, with a scant supply of provisions. Much damage was done to property in the city of Los Angeles by the floods; and orange groves were damaged to the extent of many thousands of dollars.

Dennis McGuire, a locomotive engineman on the Lehigh Valley, has been granted a month's vacation with pay and an honor button for having brought forward a new safety-first idea. He suggested to Superintendent Charles Shea that engine inspectors be equipped with magnifying glasses, so that they might more readily detect cracks and flaws on axles and other mechanism. The suggestion was at once adopted and McGuire received his reward.

The Order of Railway Station Agents, at a meeting in Boston, has adopted a resolution asking that a practical railroad man, or men, be put on the proposed new board of trustees to manage the Boston & Maine Railroad. The Order also instructed its officers to endeavor to secure the passage of a law, in Massachusetts, requiring that every person in the railroad service shall have one day's rest in seven. The president of the station agents' association is E. H. Morton of Greenwood, Mass.

Senator Norris, of Nebraska, author of the resolution introduced in Congress early in February, calling for further investigation of the New York, New Haven & Hartford, has introduced another resolution calling on the attorney general to disclose to Congress what he is doing in that direction and to what extent he intends to let guilty men escape; but some of the senators from New England took exception to the argument of the Nebraska senator and his resolution, at the present writing, seems likely to be pigeonholed in committee.

The New York, New Haven & Hartford announces that, beginning March 1, no liquors will be sold on any of the trains of the company. In New York state this rule has prevailed for years past, the length of line in that state being too small to warrant the expense of a state license for each car. In Massachusetts, Rhode Island and Connecticut, there is no provision for state licenses. In announcing this action, the company calls attention to the fact that other railroads have discontinued the sale of liquors on trains, notably twenty-five roads in Illinois, acting under a rule adopted by the General Managers' Association of Chicago.

George A. Goodell, general manager of the lines east of Paradise, Mont., of the Northern Pacific, and E. L. Harrigan, chairman of the general grievance committee of the Brotherhood of Railway Trainmen of the Northern Pacific, have been named as members of a board of arbitration to settle questions of wages and rules now pending between the Oregon-Washington Railroad & Navigation Company and its conductors and trainmen. They have been nominated by the road and the employees respectively, and will appoint another arbitrator to complete the board. Mr. Harrigan was a member of the board of arbitrators in the Burlington case. The arbitration is not to be conducted under the federal law, but is the result of an amicable agreement. The hearing will probably be conducted in St. Paul, Minn.

The "Pass Christian Volunteer Fire Company" was a feature of a recent dinner of the Gridiron Club at Washington. The alleged "firemen," with their apparatus, appeared in the midst of the feasting, and it was announced that they had come on a visit to their honorary chief, Woodrow Wilson. There hasn't been a fire in Pass Christian since the President left, and they had come north to call on him. Their arrival had been delayed 36 hours, so runs the report, through the pestiferous activity of numerous people exercising supervision over the railroads. In fact, a law had been encountered every four miles throughout the journey, and the firemen were "plumb worn out" with the paternalism of national, state and local regulations. In short, the combination of interstate, intrastate and extrastate supervision had proved almost fatal.

The army of Pennsylvania Railroad Company employees in the Altoona district, numbering approximately 21,000, with the dependent members of their families, will herald with delight the news that the Pennsylvania Railroad will issue passes in the same manner as in 1913. The thousands of workmen and members of their families have been awaiting the action of the road on the pass question since the Pennsylvania State Public Service Commission issued its edict that the granting of passes to employees and dependent members of their families by the company would not be considered as a violation of the law. General Manager S. C. Long has issued a notice to the effect that the Public Service Commission's ruling will be accepted as affording protection against exaction of penalties for the issuance of passes to dependent members of the families of officers and employees, and the notice of November 29 announcing discontinuance of passes is annulled.—*Altoona Tribune.*

Destruction of Hartford Station

The passenger station of the New York, New Haven & Hartford at Hartford, Conn., a brownstone structure built in 1889, was destroyed by fire on Saturday last. The loss is estimated at $250,000. The fire started in express matter in the room of the Adams Express Company.

The James J. Hill Building

The James J. Hill building, which is now under construction at St. Paul, Minn., is going to be the largest railway general office building in the world; at least that is the local report. It will house the general offices of the Great Northern and Northern Pacific railways, the Great Northern Steamship Company, the Great Northern Ore Company, the First National Bank of St. Paul and the Northwestern Trust Company. The building will

be twelve stories high and 240 ft. by 290 ft. It will be of steel and concrete construction with a facing of brick and stone. Charles S. Frost, of Chicago, is the architect. The ten upper floors will be divided equally between the Northern Pacific and the Great Northern, the former occupying the northern half and the latter the southern half. It is expected that the building will be ready for occupancy by January, 1916.

President Prohibits Present Giving at Panama

President Wilson has recently issued the following executive order for the Panama Canal Zone:

"It shall be unlawful for any person to give, offer, or promise to an agent, employee or servant, any gift or gratuity whatever without the knowledge and consent of the principal, employer, or master of such agent, employee, or servant with intent to influence his action in relation to the business of his principal, employer, or master; or for any agent, employee, or servant, without the knowledge and consent of his principal, employer, or master, to request or accept a gift, or gratuity, or the promise of any gift or gratuity whatever beneficial to himself, under an agreement or with an understanding that he shall act in any particular manner in respect to the business of his principal, employer, or master; or for any agent, employee, or servant authorized to procure materials, supplies, or other articles, either by purchase or contract, for his principal, employer, or master, or to employ servants or labor for his principal, employer, or master, to request or accept or agree to accept, for himself or another, directly or indirectly, a commission, discount, or bonus from the person who makes the sale or contract, or furnishes such materials, supplies, or articles, or from the person who renders such service or labor; or for any person to give or offer to such agent, employee, or servant such commission, discount, or bonus.

"A violation of any of the provisions of this order shall be punished by a fine of not less than $10 nor more than $500, or by imprisonment in jail for not more than one year, or both such fine and imprisonment in the discretion of the court."

Hope for Inventors

With the appointment of a signal engineer and an engineer-physicist, as announced in the *Railway Age Gazette* last week, the Interstate Commerce Commission is once more in a position to investigate signaling, automatic stops, and other safety devices, as was done formerly under the supervision of the Block signal and Train control board; and a circular has been issued laying down the rules under which applications are to be made by proprietors of devices which it is desired to have examined. These rules are substantially the same as those which were prescribed by the Block signal board. It will be recalled that Congress last October made a special appropriation of $25,000 for this work of the commission. Correspondence on this subject should be addressed to the Safety Appliance Division, Washington. The chief of this division is Hiram W. Belnap; assistant chief, W. P. Borland; signal engineer, F. F. Schaller; physicist, James E. Howard.

The Alaskan "Aberration"

[From the Philadelphia Public Ledger.]

The House of Representatives has improved the Alaska railroad bill by providing that the road shall be paid for by appropriations from current revenues, instead of by a bond issue. The government has not been in the habit of issuing bonds for public improvements, and there is no exigency in Alaska that justifies a departure from long-established custom. If the rivers and harbors could be improved by private enterprise there would be no justification for the present wasteful and extravagant but necessary system of developing the water highways. A private contractor could build a railroad in Alaska for much less than it will cost the government, under the proposed plan of doing $1,000,000 worth a year. Piecemeal contracts for comparatively small sums, such as are entered into for dredging the Delaware river, will be wasteful in the extreme. All the machinery of railroad construction must be carried to Alaska, and no contractor will transport this plant to the neighborhood of the Arctic Circle without figuring its cost in his bid for the work. Although the bill before Congress limits the cost of the proposed railroad to $35,000,000, much more is certain to be needed before the road is completed.

When the road is finished, the demand for public money will not cease, if the trains are to be run by the government, as is now suggested, for the balance sheet will show only what has been paid out for operating expenses and what has been received for freight and passengers. The government in Washington will have to pay the overhead charges. The Alaska railroad is nothing but a big hole into which Uncle Sam is asked to pour his money. And President Wilson and Congress seem to be consenting.

Burlington Arbitration Award

Increases in wages amounting to about $100,000 a year and a number of changes in working conditions were allowed to about 3,000 conductors and trainmen on the Chicago, Burlington & Quincy by the award of the board of arbitration, consisting of H. S. Boutell, G. J. Diekeman, Pierce Butler, P. H. Morrissey, E. P. Curtis and E. L. Harrigan, which has had the case under consideration since November 6, last. It was estimated that the demands of the employees, if granted, would have cost the company approximately $1,000,000 a year. The award was signed by all members of the board, although Messrs. Curtis and Harrigan, representing the employees, brought in a brief minority report saying they did not agree with some of the principles adopted. This is the first arbitration that has been held under the Newlands act where aribtrators not designated by the parties have been appointed by the government.

The employees' demands were embodied in 150 rules, of which 111 were adopted during negotiations between the company and the men, the remaining 39 being submitted to arbitration. The evidence included 10,000 pages of testimony and over 300 pages of exhibits. In general the increases in pay go to the lower-paid classes of employees, instead of increasing the wages of those now receiving the maximum rates and a large number of proposed rules which would have restricted the company in the use of its facilities were denied, as were various double-pay features and attempts to increase wages by changing classifications. The award contains no expression of opinion, but simply states the decisions reached.

Minimum rates of pay for passenger trainmen are fixed as follows: Conductors, $134.20 per month; baggagemen, $80.85, and brakemen and flagmen, $74.90. Various rates are fixed for different runs, ranging up to $165 for conductors, $96.33 for baggagemen and $85 for brakemen and flagmen. The demand for an arbitrary mileage basis was denied. It was agreed that the company will not make reductions in crews or increases in mileage as of December 1, 1913, for the purpose of offsetting the increases in wages. Separate rates for mixed train, suburban and other service were fixed for different runs and conditions. No increase was asked for through freight service. For local freight service conductors were awarded 4.75 cents per mile, and brakemen 3.25 cents per mile.

Cost of Mail Service

M. O. Lorenz, a statistician for the Interstate Commerce Commission, reporting to the Senate Committee on Railway Mail Pay, at the request of Chairman Bourne, says that the mail traffic does not now support its share of capital charges of the railroads; and he strongly recommends that the roads be compensated for carriage of the mails on sound commercial principles. Having found the average passenger-train car-mile earnings for the country to be 25.4 cents, and making a deduction of 10 per cent. for the probable difference in cost of haul and other items between passenger and mail cars, Mr. Lorenz concludes that 22½ cents per car-mile "would probably not constitute an overpayment, side and terminal services not being included. This would be an increase of more than 10 per cent., without reference to possible economies in loading." Continuing, the report says: "If we accept the principle that the mail service should bear its proportion of capital charges, we cannot escape the conclusion that the mail pay adjustment must be in the direction of an increase."

As to the proposition that mail pay should be adjusted on some "public utility" principle to a lower than commercial basis, advanced by the postmaster general and his second assistant, Mr. Lorenz says: "It seems desirable that in our social bookkeeping each institution or service should stand on its own bottom so far as possible. If it needs special financial assistance,

that assistance should be given directly for its own benefit." The argument that the mail service should be treated as a by-product, Mr. Lorenz declares unreasonable. "It is not logical to apply it in the present connection if we are proceeding on the basis of the commercial principle, because the mail service is not a by-product any more than the express service is a by-product, or than the whole passenger service is a by-product of the freight service, or than the freight service is a by-product of the passenger service."

Concerning the statements in House Document No. 105, Postmaster General Hitchcock's report, to the effect that the railroads were being overpaid $9,000,000 a year, Mr. Lorenz makes a simple explanation. One of these statements was based on a calculation which reduced the apparent cost of carrying the mails by assigning empty mail car haul to passenger business. But, of course, the entire space run in connection with each service should be charged to that service whether loaded or empty.

The other assumption was that the railroads would be fairly compensated if they received the cost of the service plus 6 per cent. to represent "profit." Mr. Lorenz points out that, on all operations of the railroads for the fiscal year to June 30, 1911, to every dollar of operating expense the railroads required 5.5 cents for taxes and 19.7 cents for interest and other charges, to say nothing of dividends or uncapitalized improvements. "In other words," he says, "25.2 cents at least must be allowed in addition to every dollar of operating expense to keep the roads from bankruptcy."

A Lesson in Ciphers

The Baltimore & Ohio has 2,000 offices, and the stationer, in a circular enjoining economy, says that stationery and printing cost the road in 1913 about $500,000. The offices used in that year 700,000 lead pencils, 1,000,000 pens, 23,000,000 pins, 18,000,000 envelopes, 14,000,000 sheets of carbon paper, 23,000,000 second sheets, 11,000,000 rubber bands, 570,000 blotters, 2,500,000 letter fasteners, 2,000,000 file backs, 10,000 sponges, 3,300 rules and other office articles in proportion. These supplies cost $60,000.

Dangerous and Wasteful Laws*

During the year 1913 forty-two State Legislatures were in session and a total of 1,395 bills were introduced affecting railway operation; and 230 such bills were passed. In 1912 only 48 such laws had been passed out of 292 introduced in nineteen legislatures. From August 1, 1906, to January 1, 1914, the Pennsylvania incurred expenses of approximately $12,000,000 on account of new laws—Federal and State—governing railroad affairs. Some of this legislation did good, but much of it has entirely failed to achieve its declared purpose.

The Federal law restricting the hours of telegraph operators to 9 hours resulted in an actual increase in the number of men found asleep on duty. Men with heavy continuous duties had not previously worked more than 8 hours any day. The 12-hour men had light work, but they knew when the day's work was over that they must return to duty 12 hours later. Consequently they took care of themselves. The greater leisure under the 9-hour law has encouraged misuse of time with its consequent results. The law was designed to secure additional safety. It has not added appreciably to safety, but it costs the Pennsylvania about $500,000 a year—the annual interest at 5 per cent. on $10,000,000 of capital.

The semi-monthly pay bill in several States has encouraged extravagance and made it necessary for railroad companies to exercise unusual vigilance to prevent men going on duty under the influence of liquor. This measure adds nothing to efficiency, and costs our company $250,000 a year—the annual interest on $5,000,000. Some 20 states have enacted laws, and there is pending at Washington a bill to cover the nation—compelling the use of electric headlights of high candle power. Everyone who has driven an automobile at night knows that when he approaches a car coming in the opposite direction he is temporarily blinded by the light. So it is with engineers running trains on double or four-track railroads. These measures are not in the interest of safety; they increase the danger in many cases.

Our own company is subject to laws which compel us to utilize about forty regular passenger cars for the benefit of crews on trains carrying baggage, express or mail only. The trainmen would be perfectly comfortable in one of the other cars. These cars cost about $10,000 each. Thus, $400,000 of equipment is put to this wasteful use. Extra crew laws do not contribute to the safety or the comfort of the public. They are costing us $550,000 a year in Pennsylvania, $180,000 a year in New Jersey and $120,000 a year in New York; $850,000 in these three States, or the annual interest on $17,000,000 of capital.

The laws mentioned alone thus impose an annual burden upon our company equal to the annual interest on $32,000,000 of capital.

*From an address by Ivy L. Lee, of the Pennsylvania Railroad, before the Traffic Club of New York, January 27.

The Parcel Post As a Leech

[From the Albany Journal.]

While the Interstate Commerce Commission is closely searching all the byways of the railroad business to find possible means to increase revenue without increasing rates, it should by all means scrutinize the service which the railroads are performing for the post office department. A few days ago the commission declared somewhat showily that there was something economically wrong about allowances made by railroads to industrial corporations for short-line transportation service; but there is something just as radically wrong about compelling the railroads to perform inadequately compensated service for a department of the government. Since the commission is determined to find other available sources of additional railroad revenue than the advance in rates, it should turn its eagle eyes upon Mr. Burleson's department and the "rebates" which it exacts from the railroads.

Results of Government Operation in France

A loss of $16,600,000 in net from operation and an outlay of almost $44,000,000 for extraordinary expenses measured partly the burden of state railroad operation on the French national finances during 1913, according to figures copied from the Paris *Temps* by the Bureau of Railway News and Statistics. These possess an unusually timely interest in view of the submission to the United States Senate a few days ago of estimates by Clifford Thorne, Iowa railroad commissioner, of the savings possible to the people of the United States under government ownership.

Urging discussion of the question, Mr. Thorne said that while he had not reached a conclusion that it would be wise for the government to take over the railways now, "there must be some facts in the experiences of other nations that are worthy of careful investigation."

The *Temps* strives to estimate what state ownership has cost the state treasury in the form of loans or appropriations. Operation of the two state systems, the Old and the Western, comprising together only about 5,500 miles, has resulted in steadily growing deficits. These were as follows:

	Operating deficit		Operating deficit
1909	$7,500,000	1913	$16,600,000
1910	11,200,000		
1911	13,300,000	Total	$63,200,000
1912	14,600,000		

To this loss of $63,200,000 through operating deficits in five years since 1909 must be added the extraordinary appropriations for betterments, materials, etc. To meet these needs the state has paid the following sums:

1909 to 1912—	
For the Old State Railway	$18,200,000
For the Western	76,600,000
Total	$94,800,000
1913—	
For the Old State Railway	$8,400,000
For the Western	35,400,000
Total	$43,800,000

To the end of 1913 these burdens on the state treasury were thus:

For the Old State Railway	$26,600,000
For the Western	112,000,000
Total	$138,600,000

Of this sum $77,200,000 was covered through issuance of 4 per cent. bonds, while the rest, $61,400,000, was advanced from the state funds. It is pointed out that in this policy of advancements

a further burden on the public finances on behalf of the railways exists which tends to cover up the failure of the state system, for these appropriations part of the time paid nothing, part of the time only 2½ per cent., while the interest and sinking fund of the funded debt of the state railways costs yearly 4¾ per cent. It can be understood therefore why the state railways always hesitated so long over issuance of bonds. To get a correct picture of the burdening of the state finances, however, it is necessary to include the sums thus enjoyed by the railways at the cost of the public.

The effect, it is stated, is a very unfavorable one on French finances.

"The radical socialist party," says the *Temps*, "and their revolutionary friends would like to create the impression that our present financial difficulties are purely the result of military expenditures, which are more than justified by the demands of national safety. Purposely they forget to speak of the momentous results of nationalization of the Western Railway.

"Now this foolish step, for which they are responsible and which they pressed upon parliament under the banner of 'democratic reform,' weighs down the state not only through a yearly deficit in operating revenues of almost $17,000,000, but also through the soaring debt resulting from appropriations from the treasury. In the financial difficulties of our time the purchase plays a significant role."

"All this on 5,500 miles," says the bureau. "Would Clifford Thorne apply this financing on the 254,000 miles of railway in the United States?"

Normal Development of a Railroad Man*

The railroad rank and file, as today constituted, probably has the best body of men of any commercial enterprise in the world. But men do not remain stationary. The service is constantly being depleted from retirement; from natural causes, such as death and illness, from changes in occupation, and from many other causes. This makes it necessary to employ annually on the New York Central Lines 5,000 to 10,000 new men. The railroads can examine and instruct in the several books of rules and regulations and can exercise to a limited extent only a general watchfulness over these men, but, as a rule, after they have passed the awkward squad, so to speak, and entered the ranks of the railroad army of 150,000 the identity of many of them at first becomes almost entirely lost. If then a young man has a good foundation for truthfulness, honesty and for the well-recognized traits which count for honor, and if he has somewhere in him that indefinable spark of conscience, which always points out his duty, and tells him to do it; or, even if he has not all of these with him at first, but has a good railroader with him on the engine, in the caboose, in the stations or on the tracks or elsewhere, he will soon make, and will probably remain, a good railroad man, and therefore the safest element in our wonderful transportation organism. If, on the other hand, however, a man has concealed in him bad traits of character and has bad instructors and bad associates, he is liable to become a bad man and more dangerous than the rottenest rail that was ever rolled.

We have among us thousands of men whose type illustrates what we mean by "Safe men." The best of them sometimes make a mistake, because it is human to err, but it is the high average efficiency which counts. The Empire State Express has run to date about six million miles, or around the world two hundred and fifty times. During that period I cannot find where an engineman or a conductor or any of their crews have been guilty of sufficient neglect of duty to have jeopardized the safety of the passengers who have entrusted themselves to their care. The names of these men, and many others in the service who belong to a similar honor roll, are so well known to you that they need not be mentioned here. We all know what they stand for; namely, service, and duty well done, which means Safety. We venture the belief that hundreds of men who have served under these men were taught their lessons and are giving a good account of themselves.

Now, these honor roll men, and others like them, are not mere accidents. They have learned their professions from the careful men who preceded them, and in turn must make the next generation of railroad men by the same process. The extent to which this is done, and the extent to which we continue it, is the measure of the degree of Safety which we shall attain.

*From an address by A. T. Hardin, vice-president of the New York Central given at an employees' "Safety-first" meeting in New York City, December 1.

Cold Truths for Labor Unions

[By Dr. Charles W. Eliot; Letter to a Trade Unionist.]

I agree with you that trades unions have raised wages and shortened hours, and that collective bargaining in some industries has been decidedly advantageous to the working people. There can be no question that the factory system has been greatly improved in the course of the last hundred years through the war waged by the trades unions against employers and managers, and that it needed, and still needs, improvement.

My objections to the trades unions are altogether educational and moral. They seem to me to have had a bad effect on the character and happiness of their members, because of certain methods which they have used and are still using. The first of these objectionable methods is the habitual use of violence against persons and property to gain their ends. The second is the limited output. The third is the uniform wage, alike for all journeymen without regard to age or skill. The fourth is the disregard of contracts—their own contracts, and contracts which employers or managers have entered into with owners or consumers, but have not yet fulfilled.

The first and last of these practices are grave violations of the universal moral sense. The second and third rob the workingman of strong motives for self-improvement and make it probable that he will do no hearty, zealous, faithful work. Under these conditions it is impossible to be happy in the life work, for there is no happy, contented work except that done with good will, generous zeal, and loyalty.

I cannot agree with you that the trades unions have brought happiness to any working men. Higher wages, shortened hours, better clothes, and more meat do not necessarily contribute to genuine happiness any more than the luxuries of the rich do. Happiness and content are states of mind. Is it not perfectly plain that in our country trades unionists are not really happy as a matter of fact? To my thinking they never will be so long as they get no satisfaction in their daily work. It is the grudging spirit in which they work which prevents them from getting any content out of their work for a livelihood.

All well-read, thinking people believe that the progress of civilization depends on universal, steady, productive labor; the unions seem to believe that the less one works the better.

Although profit-sharing is not applicable in all industries, I see in sound methods of profit-sharing one mode of escape from the deplorable effects of trades union teachings; for just profit-sharing will put to employer and employed alike precisely the same motive for faithful, generous, co-operative industry, and for successful productiveness. No profit-sharing method will work which does not turn out to be in the long run profitable alike to employer and employed, to owner and wage-earner, to capital and labor.

Railway Signal Association

Secretary C. C. Rosenberg announces that the letter ballot, ordered at the last annual meeting, shows that the association confirms the choice of the Board of Direction of Bluff Point, N. Y., as the place and September 22 as the date for holding the next annual meeting. On all of the other subjects submitted to letter ballot the vote was affirmative, confirming the action of the meeting, except on the report of Committee No. 7, Definitions, which was not adopted. This report goes back to the committee.

The subjects which were submitted to letter ballot are shown on pages 538-568 of the Journal of the association for December, 1913. Following are the principal items: Specifications for annunciator bells; for push buttons used for the operation of bells, etc.; specifications for floor pushes; for fuses; for steel pipe conduits; and for wrought iron pipe conduits; revision of sections 1 and 2 of specifications for vitrified clay conduits; specifications for gravity battery zincs; for copper; for jars; correction in the description in the Manual of the controlled manual block system; revision of rule 667 governing enginemen and trainmen; rules for signal foremen and maintainers; revi-

sion of specifications for mechanical interlocking now in the manual, page 498; colors of signal blades; changes in the specifications for alternating current automatic block signal system on railways using alternating current for propulsion; changes in specifications for core type impedance bonds for direct current propulsion; specifications for track transformers; changes in specifications for alternating current automatic block signal system on railways using direct current for propulsion; specifications for slate switch board; additions to specifications for material for automatic block signal system, alternating current on roads using steam propulsion; revision of specifications for mineral matter, rubber compound, insulated signal wires and cables; revision of specifications for galvanized steel wire; specifications for enameled copper magnet wire; specifications for storage battery, pages 489 to 494 inclusive; specifications for low tension wire crossings.

The vote on the colors of signal blades shows no definite result, as a large number of members voted both for a red face and a yellow face. The same confusion appears to have affected the vote on coppers for gravity batteries, a large number of members having voted both for two leaf and three leaf.

American Railway Engineering Association

The fifteenth annual convention of the American Railway Engineering Association will be held at Chicago, March 17 to 20. The meetings will be held in the Florentine Room of the Congress Hotel, beginning at 9:30 a. m. and 2 p. m. each day. The program is as follows:

Tuesday, March 17.—Address of the president. Report of the secretary. Report of the treasurer. Reports of standing and special committees.

Wednesday, March 18.—Reports of standing and special committees. Announcement of result of ballot for officers for 1914.

Annual Dinner.—The annual dinner will be given in the Gold Room of the Congress Hotel at 7 p. m. Wednesday.

Thursday, March 19.—Reports of standing and special committees. Installation of officers. Adjournment.

Friday, March 20.—Visit to exhibit of the National Railway Appliances Association in the Coliseum and Armory.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass. Next convention, May 5-8, Hotel Pontchartrain, Detroit, Mich.

American Association of Demurrage Officers.—A. G. Thomason, Boston, Mass. Convention, May 19, 1914, St. Louis.

American Association of General Passenger and Ticket Agents.—W. C. Hope, New York.

American Association of Freight Agents.—R. O. Wells, East St. Louis, Ill. Next convention, April 21, Houston, Tex.

American Association of Railroad Superintendents.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

American Electric Railway Association.—E. B. Burritt, 29 W. 39th St., New York.

American Electric Railway Manufacturers' Assoc.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

American Railway Association.—W. F. Allen, 75 Church St., New York.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.

American Railway Engineering Association.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 17-20, Chicago.

American Railway Master Mechanics' Association.—J. W. Taylor, Karpen Building, Chicago. June 15-17, Atlantic City, N. J.

American Railway Tool Foremen's Association.—A. R. Davis, Central of Georgia, Macon, Ga. Next convention, July 20-22, Hotel Sherman, Chicago.

American Society for Testing Materials.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 30 to July 4, Hotel Traymore, Atlantic City, N. J.

American Society of Civil Engineers.—C. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June and August, New York.

American Society of Engineering Contractors.—J. R. Wenlinger, 11 Broadway, New York; 2d Tuesday of each month, New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York. June 16-19, St. Paul-Minneapolis, Minn.

American Wood Preservers' Association.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 19-21, Chicago.

Association of American Railway Accounting Officers.—C. G. Phillips, Highland Park, Ill. Annual meeting, June 24, Minneapolis, Minn.

Association of Railway Claim Agents.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, 1914, St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

Association of Railway Telegraph Superintendents.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 20-23, New Orleans, La.

Association of Transportation and Car Accounting Officers.—G. P. Conard, 75 Church St., New York.

Association of Water Line Accounting Officers.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

Bridge and Building Supply Men's Association.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.

Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Montreal.

Canadian Society of Civil Engineers.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursday, Montreal.

Car Foremen's Association of Chicago.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

Civil Engineers' Society of St. Paul.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.

Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after second Saturday, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania.—E. H. Hiles, Oliver building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

Freight Claim Association.—Warren P. Taylor, Richmond, Va. Next convention, May 13, Hotel Galvez, Galveston, Tex.

General Superintendents' Association of Chicago.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

International Railway Congress.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

International Railway Fuel Association.—C. G. Hall, 922 McCormick building, Chicago. Annual convention, May 18-22, Chicago.

International Railway General Foremen's Association.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 14-17, Hotel Sherman, Chicago.

International Railroad Master Blacksmiths' Association.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

Maintenance of Way & Master Painters' Association of the United States and Canada.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.

Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York. Next annual meeting, May 26-29, Hotel Waldron, Philadelphia.

Master Car Builders' Association.—J. W. Taylor, Karpen building, Chicago. June 10-12, Atlantic City, N. J.

Master Car & Locomotive Painters' Assoc. of U. S. and Canada.—A. P. Dane, B. & M., Reading, Mass. Next convention, September 8-11, Nashville, Tenn.

National Railway Appliance Assoc.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

New England Railroad Club.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3rd Friday in month, except June, July and August, New York.

Northern Railroad Club.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

Peoria Association of Railroad Officers.—M. W. Rotchford, Union Station, Peoria; 2d Thursday.

Railroad Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

Railway Business Association.—Frank W. Noxon, 30 Church St., New York.

Railway Club of Pittsburgh.—J. B. Anderson, Penna, R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

Railway Electrical Supply Manufacturers' Assoc.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

Railway Fire Protection Association.—C. B. Edwards, Mobile & Ohio, Mobile, Ala.

Railway Gardening Association.—J. S. Butterfield, Lee's Summit, Mo.

Railway Development Association.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

Railway Signal Association.—C. C. Rosenberg, Bethlehem, Pa. Chicago, March 16; New York, June 9. Annual meeting, Bluff Point, N. Y., September 22.

Railway Storekeepers' Association.—J. P. Murphy, Box C, Collinwood, Ohio. Next convention, May 18-20, Hotel Raleigh, Washington, D. C.

Railway Supply Manufacturers' Assoc.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. Assocs.

Railway Tel. & Tel. Appliance Assoc.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

Richmond Railroad Club.—F. O. Robinson, Richmond, Va.; 2d Monday except June, July and August.

Roadmasters' and Maintenance of Way Association.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago.

St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

Salt Lake Transportation Club.—R. E. Rowland, 519 Boston building, Salt Lake City, Utah; 1st Saturday of each month, Salt Lake City.

Signal Appliance Association.—F. W. Edmonds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

Society of Railway Financial Officers.—C. Nyquist, La Salle St. Station, Chicago.

Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

Southern & Southwestern Railway Club.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

Toledo Transportation Club.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

Track Supply Association.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

Traffic Club of Chicago.—W. H. Wharton, La Salle Hotel, Chicago.

Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

Traffic Club of Pittsburgh.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

Traffic Club of St. Louis.—A. F. Versen, Mercantile Library building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

Train Despatchers' Association of America.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

Transportation Club of Buffalo.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

Transportation Club of Detroit.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, August, Chicago.

Utah Society of Engineers.—Fred D. Ulmer, Oregon Short Line, Salt Lake City, Utah; 3d Friday of each month, except July and August.

Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

Western Railway Club.—J. W. Taylor, Karpen building, Chicago; 3d Tuesday of each month, except June, July and August.

Western Society of Engineers.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News

After several meetings of traffic officers of both the eastern and western roads, it is now expected that tariffs will be filed with the Interstate Commerce Commission, effective April 1, canceling the allowance to 103 industrial roads in Official Classification territory in accordance with the principles outlined in the commission's decision in the Industrial Railways case.

The National Industrial Traffic League at a meeting in Chicago on Tuesday of this week appointed a committee of twenty-five to oppose the proposed charge for spotting cars, and retained Luther M. Walter as counsel. The committee will present witnesses at the hearing on this branch of the freight-rate question in Washington on Friday and will ask that more time be granted for hearings.

The Santa Fe now carries transcontinental freight from Galveston over the Lubbock-Texico cut-off by way of Coleman, Texas, to the Pacific Coast. The new route will be the shortest one between the Texas Gulf coast and Pacific Coast points and the Santa Fe can compete directly with the Southern Pacific. It is expected that the Santa Fe will run through passenger trains from Texas coast to California points over the cut-off.

The western railways have filed tariffs, effective March 15, providing for an extra charge for persons having the exclusive use of a drawing room or compartment. For a drawing room two full passenger fares will be required, and for a compartment one fare and a half. Similar tariffs will be made effective on the lines east of the Mississippi on March 1, so the action of the western lines makes the plan uniform throughout the United States.

It is reported at Houston that an agreement has been reached between the Galveston, Harrisburg & San Antonio and the Kansas City, Mexico & Orient whereby California oranges will be carried to northern destinations in quick time. The former line will deliver at Alpine to the Orient a trainload of California oranges daily, which will be carried to Kansas City by the Orient. Hitherto the orange trains have gone north from El Paso over the Rock Island. It is claimed that the new route will be 48 hours shorter.

The American's Love for the Train

Canon Hannay, a clerical gentleman residing in Ireland, and recently returned from a visit to the United States, is reported as finding that our most prominent characteristic is the old country-village habit of "going to the depot to see the train come in." Says the Canon: "The tradition of American hustle is a myth. All Americans boast about their trains, and their trains are vile. The transcontinental express train has only one point of superiority—it goes farther than any train in Europe." He sees in the Pullman car and the open coach in general nothing but a manifestation of the American sociability that makes for love of crowds and the detestation of solitude. Furthermore, "the Americans are so sociable and hospitable that they welcome even trains," which is the reason for the presence of railway tracks in the main thoroughfares of populous cities. "The American . . . takes his chance of being run over when he is crossing the street, because he likes to see the train, and wants to give it a hearty welcome."

Car Balance and Performance

Arthur Hale, chairman of the committee on relations between railroads, of the American Railway Association, in presenting statistical bulletin No. 162, covering car balances and performances for October, 1913, says:

The committee presents herewith statistical bulletin No. 162, covering car balance and performance for October, 1913.

The miles per car per day were 25.7, compared with 24.3 in September. This figure for October, 1912, was 26.0.

Ton miles per car per day for October were 423, compared

CAR BALANCE AND PERFORMANCE IN OCTOBER, 1913

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Grand Total.
Revenue freight cars owned	89,949	700,261	204,963	185,935	164,330	446,630	19,111	133,945	29,000	141,868	167,453	2,283,445
Average number of system cars on line	41,769	356,595	115,864	94,296	76,431	308,016	6,450	64,062	18,212	71,948	114,845	1,268,488
Railway-owned cars: Average foreign on line	57,379	314,386	111,966	77,087	69,849	173,515	10,547	68,753	26,000	45,362	45,314	1,000,158
Total Railway-owned cars on line	99,148	670,981	227,830	171,383	146,280	481,531	16,997	132,815	44,212	117,310	160,159	2,268,646
Excess	9,199	*29,280	22,867	*14,552	*18,050	34,901	*2,114	*1,130	15,212	*24,558	*7,294	*14,799
Per cent. of cars on line to total owned:												
Home	46		56	51	47	69	34	48	63	51	69	55
Foreign	64	44	55	41	42	39	55	47	89	32	27	44
All railways	110	95	111	92	89	108	89	95	152	83	96	99
Private cars on line	3,663	35,264	9,903	4,893	9,855	16,910	3,063	10,363	3,458	9,653	2,742	109,767
Total, all cars on line	102,811	706,245	237,733	176,276	156,135	498,441	20,060	143,178	47,670	126,963	162,901	2,378,413
Per cent. of cars in shop	7.26	6.68	10.60	7.37	8.04	5.06	5.77	8.26	6.68	5.43	4.94	6.56
No. of freight engines owned	1,440	10,752	3,029	3,522	2,743	7,324	502	2,747	847	2,889	2,601	38,396
Average cars on line per freight engine owned	71	66	78	50	57	68	40	52	56	44	63	62
Total freight-car mileage	60,495,435	551,572,840	155,590,354	143,474,250	133,020,446	382,332,198	35,807,494	101,020,025	36,956,137	132,285,424	153,828,181	1,886,382,784
Average mileage per car per day	19.0	25.2	21.3	26.3	27.5	24.7	57.6	24.0	25.0	33.6	30.5	25.7
Per cent. loaded mileage	74.4	68.7	72.3	69.7	71.6	71.7	72.6	71.4	70.4	73.2	73.1	70.9
Ton-miles of freight, including company freight	751,622,902	9,681,597,696	2,978,992,700	2,427,961,789	2,009,203,887	4,720,989,077	534,308,711	1,438,283,658	456,292,675	1,963,395,999	2,635,676,961	29,598,326,055
Average ton-miles, including company freight:												
Per car-mile	12.4	17.6	19.2	16.9	15.1	15.8	14.9	14.2	12.3	15.1	17.1	16.4
Per loaded car-mile	16.7	25.6	26.6	24.3	21.1	22.0	20.5	19.9	17.5	20.6	23.4	23.2
Per car per day	236	442	410	444	416	390	859	341	309	507	522	423
Gross freight earnings	$8,084,259	$56,363,153	$16,227,243	$14,892,350	$14,335,237	$44,208,656	$4,441,620	$13,999,613	$4,645,656	$20,957,261	$16,421,381	$214,576,429
Average daily earnings: Per car owned	$2.90	$2.59	$2.55	$2.59	$2.81	$3.19	$7.50	$3.37	$5.17	$4.78	$3.16	$3.03
Per railroad car on line	2.63	2.71	2.30	2.80	3.16	2.96	8.43	3.56	3.39	5.79	3.31	3.06
All cars on line	2.54	2.58	2.20	2.73	2.96	2.86	7.14	3.32	3.14	5.35	3.25	2.92

*Denotes deficiency.

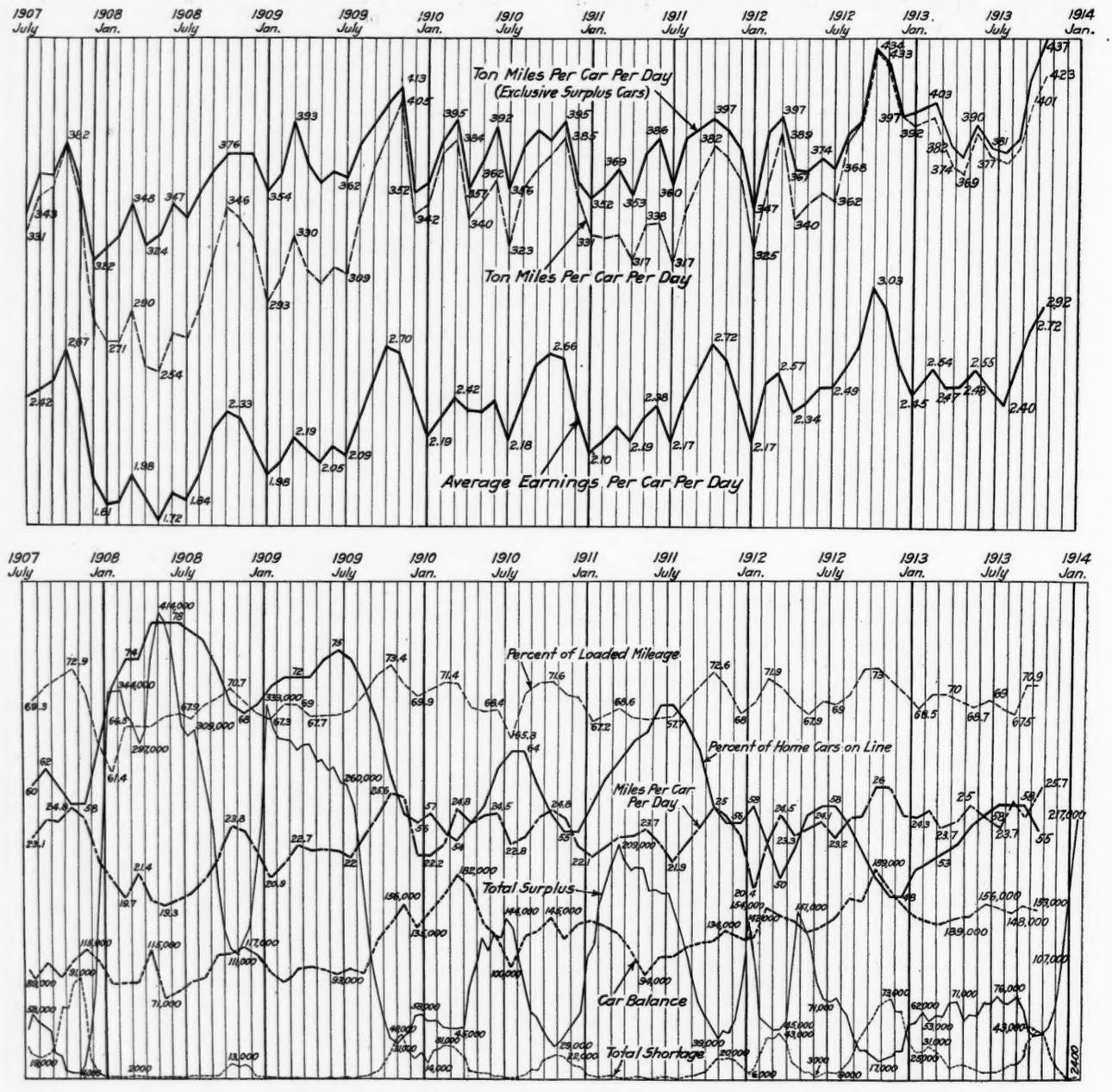
with 401 in September. This is a decrease of 2.31 per cent. compared with the figure for October, 1912, which was 433.

The proportion of home cars on line was 55 per cent. compared with 58 per cent. in September. This is an increase of five points over October, 1912.

The per cent. of loaded car mileage remained the same in October as in September when it was 70.9 per cent. This figure for October, 1912, was 73 per cent.

The average earnings per car per day for all cars on line increased 20 cents to $2.92 in October, 1913. This figure for October, 1912, was $3.03.

The accompanying table gives car balance and performance in the month covered by the report, and the diagram shows car earnings and car mileage and different car performance figures monthly from July, 1907.



Freight Car Mileage, Earnings and Performance, 1907 to 1914

"Safety-First" in the Harbor Service

At a mock parliament, held in Bristol, England, the "Hon member for Stranraer" asked the "Right Hon the president of the board of trade" (referring to the merchant shipping act, 1894, prevention of collisions) "whether a lighter having two light lighters in tow, would be required to light a lighter light on the lighter lighter, so that the lighter the lighter the lighter the light?"

The president replied: "Obviously the answer is in the negative, since the lighter lighter being the lighter, and the use of the comparative 'lighter' denoting that the lighter is already 'light,' the lighter of the lights would not be required to light a lighter light on the lighter lighter, since the lighter lighter is lighter than the light lighter."

Metal Railway Ties in Switzerland.—Metal railway ties were first used on the railways of Switzerland in 1881. At the present time they have been introduced to so great an extent that about 70 per cent. of the ties in use on the federal railways are metal. Iron ties are recommended where good gravel is available for ballast. Wooden ties are still used in tunnels and other places where the conditions do not permit of good drainage.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has further suspended from March 12 to September 12 a Maine Central tariff proposing increased rates on lumber in carloads from points on the Maine Central to certain interstate points.

A hearing was held on February 18 at Kansas City before Commissioner Meyer on a complaint filed by the Kansas City Board of Trade asking for a reduction in the rates on grain from Kansas City to Memphis and the southeast.

The commission has suspended from February 23 to June 23 certain items in a tariff of F. A. Leland, agent, proposing increased rates on lumber, except cypress, in carloads, from Lake Charles and Westlake, La., to certain points in Texas.

The commission has further suspended from March 7 to September 7 Rutland tariff, providing for the cancellation of through joint commodity rates from stations on the Rutland in Vermont to New York City via Troy, N. Y., and Murray's Line of Steamers.

The commission has suspended from February 26 to June 26 certain schedules in a tariff of Eugene Morris, agent, increasing rates on cement in carloads, and other commodities from Mitchell, Ind., to Memphis, Tenn., New Orleans, La., and other points.

The commission has suspended from February 20 to June 20 certain schedules in a St. Louis & San Francisco tariff proposing increases in class and commodity rates between Kansas City, Mo., Omaha, Neb., and other Missouri river points and stations in Missouri.

The commission has suspended from February 20 to June 20 certain schedules in a tariff of C. B. McCain, agent, Eugene Morris, agent, and R. H. Countiss, agent, proposing increased rates on furniture in carloads from North Carolina and Virginia points to Utah, Nevada, etc.

The commission has further suspended from March 19 to September 19, a Missouri, Kansas & Texas tariff containing proposed increased rates on soft coal in carloads, from Fleming Mine and West Mineral, Kans., to certain stations in Oklahoma on the Missouri, Kansas & Texas Railway.

The commission has suspended from February 26 to June 26 tariffs of the Pennsylvania Company and Pittsburgh, Cincinnati, Chicago & St. Louis, eliminating from the list of commodities subject to transit privileges at Pittsburgh, Pa., bran, middlings or screenings in packages.

The commission, having received complaints that the relationship between import and domestic rates is unreasonable and subjects domestic traffic to disadvantage, has on its own initiative instituted an inquiry into the rates, practices, rules and regulations of the carriers relating to such import business.

The commission has further suspended from March 1 to September 1 certain schedules in Agent R. C. Fyfe's supplement No. 10 to Western Classification No. 52, proposing to increase the rating upon less than carload shipments of stick licorice and licorice confections, in barrels, boxes or pails.

The commission has suspended from February 22 to June 22, 1914, certain schedules in a tariff of L. A. Lowrey, agent, providing for an increase of $3 per car upon shipments of sand reaching Chicago via lines of the Chicago & North Western and Chicago, Milwaukee & St. Paul for delivery at points on the Baltimore & Ohio, Lake Shore, Michigan Central and certain other lines in Chicago.

Subsidiaries of the United States Steel Corporation, including the Union Railroad, the Newburgh & South Shore, and the Lake Terminal Railroad, have made an application to the commission for reopening the Industrial Railways case. In this application they say that the principal object of reopening the case is to get a further interpretation by the commission of its views, and they also protest against the findings of the commission in regard to iron and steel products and coal and ore, on the ground that these commodities are never handled on to team tracks and that therefore there is no discrimination, while the rates on these products are so high as to obviously include a proper charge for the terminal service, including switching and spotting of cars.

Express Rates; Interstate and Intrastate Uniform

A conference was held recently between the representatives of all the large express companies of the country and the Interstate Commerce Commission looking to a readjustment of their classifications. Numbers of complaints have been received both by the commission and the express companies against rates, but more especially against the classifications of about some 60 or more articles. The express companies are anxious to adjust these matters to the satisfaction of the shipping public, and at the same time to be in full accord with the requirements of the commission in the matter. Another matter in connection with the working out of the express situation is the determined effort which the express companies are making to have the various states adopt the same ratings and classifications for intrastate rates which are now required by the commission with regard to the interstate rates. So far thirty states have agreed, through their railroad commissions, to adopt the same scales and classifications.

Export Rates from Pacific Coast Points

Alexander A. Erickson Company v. Chicago, Milwaukee & St. Paul et al. Opinion by the commission:

The commission finds that there is no discrimination to complainant even though defendants' inland proportion of the through rates on "all commodities" from Chicago via Vancouver on traffic destined to Australia exceeds is the inland proportion of through rates from the same point of origin to Japan, China and the Philippines or although they exceed the inland proportion of the through rates from Chicago to Australia or the Orient via Tacoma and Seattle. (29 I. C. C., 414.)

Rules Governing Concentration of Cotton at Arkansas Points

Opinion by Commissioner Clark:

Under the rule under investigation in this case, cotton and cotton linters may be concentrated at Little Rock, Pine Bluff, Camden and Texarkana, and reshipped to interstate destinations, being accorded the benefit of low inbound rates, provided outbound shipments are not routed by the shipper except as to the terminal line at destination. The commission finds that such a rule is contrary to the act to regulate commerce and should be canceled. It holds, however, that the offer of comparatively low any quantity rates in consideration of economy of car supply and expedition in handling may justify the maintenance of a tariff rule giving shippers the option of directing routing via established routes upon payment of higher local rates or of availing of special low inbound rates limited in application to traffic, the routing of which from the concentration point is left to the carrier, or to traffic routed by the shipper via the respondent's long haul junctions or routes specifically named in the tariff. (29 I. C. C., 106.)

Release Rates and Classification

Norcross Brothers Company v. Louisville & Nashville et al. Opinion by Commissioner Clements:

Complainant's sub-contractor made a shipment of two carloads of sand-rubbed marble, describing it as finished marble, agreed to be of a value of 40 cents per cubic foot. Charges were collected at a rate of 36½ cents per 100 lb., assessed on that commodity at the agreed value stated. The commission finds that the shipment should have been billed as sand-rubbed marble included in the tariffs in the description of rough marble under an agreed value of 20 cents per cubic foot at a rate of 23½ cents per hundred pounds and awards reparation on that basis. In a case of this sort the carrier should make clear the distinction between rates on a commodity based on the values of different classes or kinds thereof as opposed to rates based on the release to a certain amount of the carrier's liability for loss or damage. (29 I. C. C., 109.)

Switching Charges Abolished

J. A. Adams & Sons Company, Ltd., et al v. Vicksburg, Shreveport & Pacific. Opinion by Commissioner Clark:

Complainants severally engaged at Monroe, Ruston, Gibbsland and Sibley, La., in the manufacture of lumber, staves and heading (barrel material) contend that the defendant discriminates against them in favor of shippers at Vicksburg and Jackson Miss., in the matter of rates and transit privileges. The commission upon investigation finds that the transit privileges at the several points have quite different modes of operation, but that in the long run the result is about the same, except for the switching charges assessed at the four Louisiana points. It holds, therefore, that it is discriminatory against complainants for defendant to assess switching charges against them while according a like service without charge to competitors at Vicksburg and Jackson. (29 I. C. C., 52.)

Discrimination in Switching Service

Buffalo, Rochester & Pittsburgh v. Pennsylvania Company. Opinion by Commissioner Clements:

In this case the Pennsylvania Company refuses to transport cars for the Buffalo, Rochester & Pittsburgh to and from industries on the Pennsylvania Company's lines within the switching limits of New Castle, Pa., but it does transport similar traffic for the Erie, Baltimore & Ohio and Pittsburgh & Lake Erie, serving the same point. The commission finds that this constitutes a discrimination against the Buffalo, Rochester & Pittsburgh and that the Pennsylvania company has not sufficient justification in that it obtains reciprocal advantages in the way of switching from the other carriers at other points and that the Buffalo, Rochester & Pittsburgh is not in a position to render such reciprocal services. (29 I. C. C., 114.)

Alexandria, Va., Switching Charges

Opinion by Commissioner Prouty:

The Southern Railway has proposed an increase from 11 cents per net ton to 35 cents in the charges for moving coal and coke from the Potomac yard near Alexandria, Va., to Alexandria proper. The commission finds that such an increase is not justified, but allows an increase to 20 cents, because the movement is more than a mere switching movement. (29 I. C. C., 381.)

Reparation Awarded

Charles Weisse & Company v. The Cincinnati, Hamilton & Dayton et al. Opinion by the commission:

The commission finds that certain charges for the transportation of 20 sacks of stearic acid from Ivorydale, Ohio, to Sheboygan Falls, Wis., were unreasonable, in that they exceeded charges that would have accrued on the basis of the aggregate of the immediate rates in effect at that time. Reparation awarded. (29 I. C. C., 374.)

Lumber Rates from Louisiana Points

Stewart-Greer Lumber Company et al. v. St. Louis, Iron Mountain & Southern et al. Opinion by the commission:

The commission finds that a rate of 14 cents per 100 lb. on hardwood lumber in carloads from Mangham, Baskin and Winnsboro, La., and points taking the same rates to New Orleans, La., for export is not unreasonable. Application under the fourth section for authority to maintain a lower rate on hardwood lumber for export from Rayville, La., to New Orleans than from the other points which are intermediate, is denied. The fact that the Iron Mountain, the short line, has reduced the rate to 10 cents to meet the rate of a longer line does not afford a proper basis for relief from the requirements of the fourth section. (29 I. C. C., 120.)

Rates on Crushed Stone from McCook and Thornton, Ill.

Opinion by Commissioner McChord:

It is proposed in a Baltimore & Ohio Chicago Terminal tariff to increase the rate on crushed stone from McCook and Thornton, Ill., to stations in Indiana and Michigan reached via the Chicago, Indianapolis & Louisville from 35½ cents per ton to 45½ cents, the principal reason for the increase being to allow the Monon a division of 30 cents instead of 20 cents. The commission holds that the carrier has not justified the increase. It believes that the present divisions should remain unchanged, although it makes no ruling to that effect. (29 I. C. C., 136.)

Embargo Regulations

New York Hay Exchange Association v. Lehigh Valley. Opinion by the commission:

The commission finds that certain demurrage charges collected on two embargo notices relating to the receipt of hay at certain New York terminals were unjust in that in them the word "billed" was construed to mean received at Jersey City terminals instead of waybilled at the point of origin. It is also held that such embargo notices should be posted a reasonable time in advance at the stations to which they apply. (29 I. C. C., 90.)

The Rates on Iron and Steel from Oklahoma City

The Oklahoma Traffic Association v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner McChord:

The commission finds that rates on iron and steel articles in carloads from Pittsburgh, Pa., Chicago, Ill., Birmingham, Ala., and points taking the same rates to Oklahoma City, are unduly discriminatory against that point as compared to Sapulpa, Tulsa, McAlester and Muskogee, which are points in Oklahoma lacking the same advantages of location and transportation facilities. No order is made in the case, but defendants will be expected to establish before May 1 rates between points involved which will remove the existing discriminations. (29 I. C. C., 129.)

Rates on Petroleum to Arizona Points

Pacific Creamery Company v. Southern Pacific et al. Opinion by Commissioner McChord:

The commission finds that the rates on fuel oil from Los Nietos in the California oil fields to Creamery and Gilbert, Ariz., should not exceed $4.75 per ton. It is also found that the present rates on fuel oil, refined petroleum and engine distillate from producing points in California, Kansas, Louisiana and Texas to all points in Arizona are unreasonable as compared to rates from these producing fields to other points. Reasonable rates are therefore prescribed for the future. In each case the rates may be blanketed over the state of Arizona or the carriers may divide the state into 50 mile zones east and west of Phoenix between parallel lines extending north and south. The rate on engine distillate must be made on a basis of 80 per cent. of the rates on petroleum and its products. (29 I. C. C., 405.)

Rates on Coal from Pittsburgh Districts to Youngstown

Youngstown Sheet & Tube Company et al. v. Pittsburgh & Lake Erie. Opinion by Commissioner Clark:

The commission finds that a rate of 70 cents per net ton on bituminous coal in carloads from the Pittsburgh coal district to the Youngstown or Valleys district of eastern Ohio and western Pennsylvania is not unreasonable or unjustly discriminatory. The ton-mile earnings indicate that the revenue obtained is not too great, whereas to change this one rate would necessitate the change also in rates on from 50,000,000 to 67,000,000 tons of coal per year. The fact that the present rate has been in effect for ten years offers the presumption that it is reasonable. (29 I. C. C., 428.)

Switching Charges on Grain at Chicago

Board of Trade of Chicago v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Meyer:

The commission finds that the failure of the five defendant carriers to absorb the switching charges on grain from noncompetitive points, delivered to Chicago industries off their line while absorbing such charges in the cases of other commodities according to the terms of the Lowrey tariff does not constitute unlawful discrimination. The commission believes, however, that the defendants may fairly be expected to absorb the charges on grain for local delivery, that outbound rail carriers should continue their present practice of absorbing on

grain taken by them from Chicago to destinations beyond, and that the switching charges on grain moving out by lake, should be the subject of arrangement in the charter agreement between the shipper and the boat. No order is made in the case, therefore, but it is left open for such further action as the commission may deem proper. (29 I. C. C., 438.)

Switching Charges at Bellefonte, Pa.

Botsford & Barrett v. Pennsylvania Railroad. Opinion by the commission:

The commission finds that the defendant's charge of 4 cents per 100 lb., a minimum charge between any two points on its line, for switching grain in carloads at Bellefonte, Pa., is unreasonable, in that it exceeds a rate of $5 per car. Reparation awarded. (29 I. C. C., 469.)

Montana Pass Situation

In the matter of the issuance and use of passes, franks, and free passenger service. Opinion by Commissioner Harlan:

The commission includes in this report an account of the correspondence between John T. Denvir, a member of the upper house of the Illinois legislature, and the Chicago, Burlington & Quincy and other roads in which the threatened legislative retaliation because refused free passes over their lines. Comments on this matter were made in the editorial and news columns of the *Railway Age Gazette* of December 5. As to conditions in Montana, the commission says:

"In this connection it may be well to say that our investigations in Montana indicate a condition of affairs in that state that we regard as reprehensible. An act, recently enacted by the legislature, was evidently intended to authorize carriers to issue free transportation to state officials when traveling within the state in the public interest; but instead of being administered on that basis it is being made the occasion for a more or less wide distribution of passes among public officials for their personal use and benefit. As the result of our investigations in Colorado, indictments were found and fines have lately been imposed against interstate shippers who have used state passes and against the carriers that granted them such favors; the gift by interstate carriers of state passes to public officials and others who are not shippers is an evil not so directly within our power to redress. On broad general grounds, however, all must condemn such practices, and the carriers that dissipate their revenues in that form and recoup the loss in their rates will find, sooner or later, that this commission will not lose sight of the practice when their rates are questioned in complaints pending before use." (29 I. C. C., 411.)

Rates on Hides and Pelts from Points in Oklahoma

Crowdus Brothers et al v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Clark:

The commission finds that the rates on hides and pelts from points in Oklahoma to St. Louis, Chicago, Milwaukee and other points involved should not exceed the rates contemporaneously in effect on packing-house products. It is also held that the relationship of rates between Oklahoma City and the points to the north and south of it is unduly favorable to Fort Worth and Wichita. It is, therefore, ordered that the rate from Oklahoma City to St. Louis should be made 3 cents per 100 lb. higher than from Wichita, and that the rate from Fort Worth should exceed that from Oklahoma City by 5¼ cents per 100 lb. The commission also awards reparation on the shipments of hides and pelts made by complainant from December 11, 1911, on which date the findings were promulgated in Investigation of Alleged Unreasonable Rates on Meats on the basis of the rates prescribed in that investigation. (29 I. C. C., 449.)

Unreported Opinions

Middleburg Stone Company v. Baltimore & Ohio et al.

The commission finds that the charges paid on a carload of grindstones from Berea, Ohio, to Freehold, N. J., were not unreasonable.

Edward Byrnes, trustee, v. Atlantic Coast Line et al.

The commission refuses reparation on certain shipments of oranges, grapefruit and pineapples from points in Florida to points in central freight association territory and western trunk line territory.

Columbus Board of Trade et al v. Southern Railway.

The commisison finds the charges on a horse shipped from Richmond, Va., to Columbus, Ga., to be unreasonable.

Ballou & Wright v. New York, New Haven & Hartford.

The commission finds that the rate charged for motorcycles in carloads from Emory, Mass., to Portland, Ore., was unreasonable in that it exceeded the first class rate.

Ryan & Newton Company v. Northern Pacific et al.

A rate of $1.50 per 100 lb. from East St. Louis and St. Louis to Spokane, on grapefruit, in carloads, used as a factor in the through rate from points of origin in Florida to Spokane, is found to have been unreasonable.

Fourth Section Applications

The following applications for relief under the fourth section of the act to regulate commerce have been granted by the commission:

Norfolk & Western.—To establish certain rates on unmanufactured tobacco from North Carolina points to Winston-Salem.

M. P. Washburn, agent, for the Louisville & Nashville, etc.—To cancel commodity rates on cotton linters from New Orleans, Mobile and Pensacola to south Atlantic ports.

M. P. Washburn, agent.—To publish a minimum weight rule in connection with commodity rates on pig iron from southern furnaces to Ohio and Mississippi river crossings.

W. H. Hosmer, agent.—To establish special rates on divi-divi pods, cocoa beans, etc., from gulf ports.

E. H. Hinton, agent.—To establish rates on canned goods from Rockwood, Spring City, etc., Tenn., to southern points similar to those from Sweetwater, Tenn.

Cincinnati, New Orleans & Texas Pacific.—To apply common and fire brick rates to tile slabs, etc., from Tennessee to southern points.

Louisville & Nashville.—To establish a rate of 10 cents from Montgomery and Birmingham to New Orleans, Port Chalmette, etc., 11 cents from Montgomery and Selma, and 10 cents from Birmingham on cotton ties and cotton tie buckles.

The following applications have been denied:

M. P. Washburn, agent, for the Illinois Central, etc.—To establish certain rates on iron and steel from Ohio river crossings to Monticello, Ga.

Atlantic Coast Line et al.—To establish a rate of 25½ cents on clay conduits, minimum 50,000 lb., Clermont, Pa., to Charleston, Savannah, Brunswick and Jacksonville.

Carrier's Rule Relating to Shipments to Order Upheld

Ludowici-Celadon Company v. Atlantic Coast Line. Opinion by the commission:

Complaint is made against the following rule embodied in a circular of instructions to defendant's freight agents, but not filed with the commission: "Agents will decline to receive shipments of freight to order to notify parties residing elsewhere than at points to which shipment is made." The commission finds that the rule is not unreasonable. The carrier, however, should file the rule with the commission, omit an exception as to cotton for which the need no longer exists, and in the future observe the rule uniformly as to all shippers, so that there may be no discrimination. (28 I. C. C., 693.)

Export Rates

Port Arthur Rice Milling Company v. Texarkana & Fort Smith, et al. Opinion by the commission:

Complainants having shipped 12 carloads of clean rice from Lake Charles, La., to Port Arthur, Tex., and not having noted that the goods were destined for export, were charged at the domestic rate of 15 cents per 100 lb. The commission finds that the correct charges were collected. The mere intention on the part of a shipper to export his traffic, unaccompanied by any circumstance or outward indication that the traffic is in fact for

export, is not sufficient to stamp it as foreign commerce or to allow it export rates. (28 I. C. C., 697.)

Minimum Charge Rule

Minneapolis Brewing Company, et al., v. Atchison, Topeka & Santa Fe, et al. Opinion by the commission:

The commission finds that a rule in a western trunk line circular under which single shipments of empty beer packages are subjected to a minimum charge of 100 lb. at the third class rate is reasonable, even though the western classification at the same time provides a rating of one-half fourth class on the same commodity. (28 I. C. C., 688.)

Rates on Grain and Grain Products to Texarkana

Opinion by Commissioner Clark:

The St. Louis, Iron Mountain & Southern and its connections have proposed to withdraw the proportional rates on grain and grain products from certain interior-milling points in southern Illinois and southeastern Missouri to Texarkana, Ark. In a similar case in which it was proposed to cancel proportional rates from certain interior milling points in southern Illinois to Texas points, it was decided that the cancellation was not justified. The commission now holds that there is no reason for independent treatment of the rates to Texarkana or for different action than was taken in the former case. (29 I. C. C., 35.)

Lumber Rates Through Ohio River Crossings

Opinion by Commissioner Harlan:

The commission finds that the cancellation of certain routes involving a three line haul for the movement of lumber through Cairo and Thebes via the St. Louis, Iron Mountain & Southern and the St. Louis Southwestern through the St. Louis or East St. Louis gateway to destinations on the Santa Fe in Illinois and also Fort Madison in Iowa is justified. There will be no disadvantage to any shipper, because there will still remain available routes at the same rates via other lines involving but a two line haul. (29 I. C. C., 38.)

Car Distribution in Iowa

Board of Railroad Commissioners of the State of Iowa v. Chicago, Rock Island & Pacific et al. Opinion by Commissioner Clements:

Complaint is made that cars for the transportation of grain are not distributed upon an equitable basis in Iowa during periods of car shortage, and many shippers desire the establishment of a rule for supplying cars to elevators according to their comparative past volume of business over a given period. The commission finds in favor of a continuance of the present scheme whereby cars are distributed as nearly as practicable according to the grain offered for shipment day by day and ready for loading within a reasonable time under car demurrage rules. No hard and fast rule can be set; a great deal depends upon the discretion of the station agent. (29 I. C. C., 396.)

Terre Haute Rates Remain Unchanged

Commercial Club of Terre Haute et al v. Vandalia Railroad et al. Opinion by Commissioner Clements:

Complaint is made against an alleged unreasonableness and undue discrimination in the rates adjustment between Terre Haute, Ind., and the Missouri river and territory west thereof, the allegation as to discrimination being based primarily upon the fact that the Chicago basis of rates is extended to Milwaukee and other Wisconsin points and to Gary, Ind., Danville, Ill., and certain other Indiana and Illinois points, while it is denied to Terre Haute. The commission finds that the circumstances and conditions affecting the transportation to and from the other points named are substantially dissimilar to those obtaining with respect to the Terre Haute traffic and that the present adjustment between Terre Haute and the western territory is neither discriminatory nor unreasonable *per se*. (29 I. C. C., 383.)

Reparation on Shipments of Sulphuric Acid

International Agricultural Corporation v. Louisville & Nashville et al. Opinion by Commissioner Prouty:

Detailed statements showing reparation desired have been presented in accordance with a former opinion in this case terming certain rates on sulphuric acid unreasonable. Trouble having arisen as to the apportionment of the payments, the commission declares that it does not attempt to determine the proper proportion to be paid by each carrier. It is also decided that if a consignor brings complaint against a rate found later to be unreasonable and upon which reparation should be awarded, a consignee who has paid the freight money, instead of the consignor, can obtain no recovery if more than two years have elapsed. A rate of $3.25 per ton on sulphuric acid from Copperhill, Tenn., to Savannah, was reasonable at the time a rate of $7.50 was being exacted, and reparation should be awarded on that basis. Carriers collecting charges to which they are not entitled must pay interest on the money. (29 I. C. C., 391.)

STATE COMMISSIONS

The Illinois Public Utilities Commission has again suspended until April 23 a proposed advance in grain rates in Illinois to correspond with an interstate advance that has been allowed by the Interstate Commerce Commission.

The railroad commission of Louisiana has dismissed the complaint calling for an order requiring station agents in small towns to deliver freight at any time of day or night when they are on duty. The commission finds that there is no reasonable necessity for adopting such a rule.

The railroad commissioners of Montana have announced their decision to order reductions in freight tariffs of 26 per cent., the offer of the railroads to make a smaller reduction being rejected; but the matter is deferred until April 20, when a hearing will be given. In the meantime, it is said, the reduction offered by the railroads will be put into effect. The new tariffs are said to apply mainly to shipments of freight from the principal wholesale centers of the state.

The railroad commission of Louisiana has modified its block signal order, so far as it relates to the Illinois Central and the Yazoo & Mississippi Valley, relieving these companies from the operation of the order for four years, provided a length of 82 miles is equipped with automatic block signals within one year. The commission has also modified its rule relative to flagging, to accommodate these roads; and has remitted the fine of $500 which had been imposed.

The order of the Texas Railroad Commission fixing the basis of divisions for joint hauls on company materials, which was to have become effective February 18 has been cancelled, Chairman Allison Mayfield having withdrawn his name from the order. The commission holds that it has no jurisdiction over questions of divisions until the railroads disagree and cannot fix a basis, and that it will not anticipate disagreements. The matter was brought up by the controversy at Laredo between the Rio Grande & Eagle Pass, and the Texas-Mexican lines. The latter buys coal from mines on the former road and has it billed to a station beyond Laredo on its own line, and claims a division because of the last service. The Rio Grande & Eagle Pass has refused to allow a division on the ground that the coal is not actually transported to the station west of Laredo, but is used in Laredo, the junction point. Under the Interstate Commerce Commission's rule the Texas-Mexican would be entitled to a division if the coal were actually hauled to the station west of Laredo, but if not so transported the company could not claim part of the rate.

PERSONNEL OF COMMISSIONS

Governor Glynn of New York has appointed Seymour Van Santvoord, of Troy, a member of the Public Service Commission, Second district, in place of Frank W. Stevens, whose term expired a year ago. Mr. Van Santvoord is a lawyer, 55 years old. He is a Democrat and was a friend of former President Cleveland.

B. J. Dalton, whose appointment as assistant district engineer of the Western district, Division of Valuation, Interstate

Commerce Commission, with headquarters at Kansas City, has already been announced in these columns, was born in 1865 at Franklin, Ky. He was graduated from the University of Kansas in 1890, and during 1891 and part of the following year he was division engineer in charge of construction on the Texas, Louisiana & Eastern. From 1893 to 1895, he was engaged in general practice as civil engineer, and the next three years he was division engineer in charge of construction on the Kansas City, Pittsburg & Gulf. He was then appointed chief engineer of the Kansas, Oklahoma Central & Southwestern, and the following year, when the Atchison, Topeka & Santa Fe absorbed this road, Mr. Dalton was made resident engineer. From 1900 to 1903, he was assistant chief engineer of the St. Louis & North Arkansas and the Arkansas & Choctaw. The succeeding two years he was city engineer of Lawrence, Kan., after which he returned to railway service as division engineer of the Denver, Enid & Gulf, of which road he subsequently was made chief engineer. Afterwards he was chief engineer of the Denver, Kansas & Gulf, and in 1906 he became connected with the University of Kansas as associate professor of civil engineering, and later was made professor, which position he now resigns to become associated with the Interstate Commerce Commission, as above noted.

Frank H. Adams, senior mechanical engineer of the Western district, Division of Valuation, Interstate Commerce Commission, whose appointment has already been announced in these columns, was born April 15, 1866, at Woodville, Miss. He was graduated from the high school in Lake City, Minn., in 1884, and attended the University of Minnesota, 1884 to 1887. He entered railway service in September, 1887, as special apprentice with the St. Paul & Duluth, where he remained until February, 1891. He then went to the Atchison, Topeka & Santa Fe as chief draftsman in the office of the superintendent of machinery of the Gulf Lines at Galveston, Tex., which position he held until November, 1901. On the latter date Mr. Adams was appointed on the staff of the superintendent of motive power of the entire Santa Fe system as engineer of shop extension, with headquarters at Topeka, Kan. He resigned February 1 to accept the appointment as senior mechanical engineer of the Western district, Division of Valuation, Interstate Commerce Commission, in charge of the mechanical department, including motive power and car equipment, with headquarters at Kansas City, Mo., as above noted.

F. H. Adams

Frank B. Scheetz, who recently was appointed senior structural engineer in charge of the bridge and building department of the Western district, Division of Valuation, Interstate Commerce Commission, with office at Kansas City, Mo., as already noted in these columns, was born December 14, 1867, at Monroe City, Mo. He attended the State University of Missouri, 1884-1887, taking a civil engineering course, and began railway work in 1887 as slopeman with locating party on the St. Louis & San Francisco in Indian Territory. From August, 1888, to February, 1889, he was rodman and levelman on the Kansas City, El Paso & Northeastern, and in April, 1889, he went to the Missouri Pacific as rodman on construction and location. He was then consecutively transitman on construction of drawbridges over the Arkansas and Red rivers and engineer in charge of construction of the drawbridge over Little river for that road. In June, 1892, he went to the Missouri, Kansas & Texas as engineer in charge of construction for six months, and from February to October, 1893, was on maintenance of track work on the St. Louis & San Francisco. He was from November, 1893, to March, 1896, instrumentman on maintenance of track on the St. Louis, Iron Mountain & Southern, and from the latter date to July, 1905, was assistant engineer of bridges and buildings of the Missouri Pacific and the St. Louis, Iron Mountain & Southern. He was then promoted to engineer of bridges and buildings of those roads, resigning in July, 1910, to go with the Kansas City Bridge Company as contracting engineer, which position he held until his recent appointment on February 1 as senior structural engineer, Western district, Division of Valuation, Interstate Commerce Commission, as above noted.

COURT NEWS

The Cleveland, Cincinnati, Chicago & St. Louis on February 10 filed suit in the United States District Court at Chicago against the Illinois Surety Company charging failure to pay to the railroad $100,000 in forfeited bonds as surety for freight charges against the O'Gara Coal Company, which is in the hands of receivers.

The New Jersey Supreme Court has handed down a decision which sets aside the order made by the State Utilities Commission, requiring railroads to provide drinking water on all passenger trains making trips of 30 minutes or more within the state. Several of the railroads opposed the order on the ground that it required them to furnish cooled water on trains where it was seldom called for.

A press despatch from Gulfport, Miss., says that the state court at that place has imposed a fine of $402,000 on the Louisville & Nashville for disobedience of an order of the Mississippi State Railroad Commission requiring the railroad company to stop certain trains at Bay St. Louis. The order of the court enjoins the company from doing intrastate businesss until the fine is paid, but the company has appealed and has given a supersedeas bond.

Arguments were presented before Judge Landis of the United States district court at Chicago on February 19 and 20, on the petition of the Interstate Commerce Commission for an order to compel F. W. Ellis, vice-president of the Armour Car Lines, to answer questions regarding the relations of the car lines to Armour & Company, and various details of their operations. George P. Boyle and P. J. Farrell appeared for the commission, and said that the information was desired by the commission for the purpose of determining whether the car lines corporation is a device by which Armour & Company receives concessions from the railways. Mr. Farrell argued that as the car lines perform under contract a service which the railways are required to perform they cannot refuse to give information necessary to the commission on the ground that their affairs are mixed up with those of a private concern. Frank B. Kellogg, representing the Armour Car Lines, argued at length on the proposition that the relations of the car lines are entirely with the railways, not with the shippers, and that the commission has no power to inquire into anything back of those relations.

A SUBMARINE TUNNEL FROM SWEDEN TO DENMARK.—A Danish and a Swedish engineer have started negotiations with the Danish and Swedish governments relating to a proposal for the construction of a railway tunnel under the sound from Malmo, Sweden, to Copenhagen. The distance is about 21 miles, and the estimated cost is $25,000,000.

A RAILWAY BETWEEN FRANCE AND SPAIN.—The distance by the most direct railway from Madrid to the French frontier is 392 miles. The distance in a straight line does not exceed 300 miles. The idea of constructing a new and shorter railway line has been under consideration for some time. On January 27, the government issued a royal order directing the chief engineer of the bureau of roads, canals and ports to proceed immediately with the surveys and estimates for the construction of double track railway of standard gage, to be operated by electricity from Madrid to the nearest point on the French frontier. The order also instructed the civil governors of the provinces and their chief engineers to lend their cooperation so that the surveys might be finished as soon as possible. It is evidently the idea that the road if considered necessary is to be constructed and operated by the state.

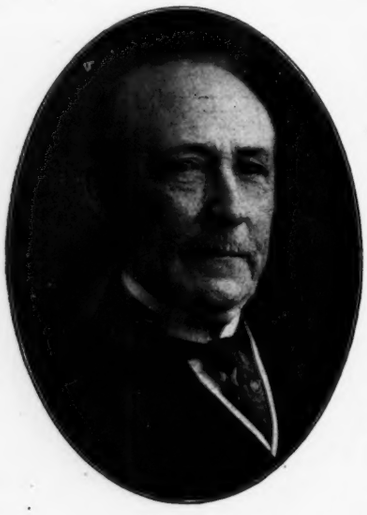
Railway Officers

Executive, Financial, Legal and Accounting

F. A. Peil has resigned as assistant secretary of the Oregon Trunk.

John W. Everman, general superintendent of the Texas & Pacific at Dallas, Tex., has been elected president of the Union Depot Company of El Paso, Tex.

James T. Leary, general auditor of the Baltimore & Ohio at Baltimore, Md., has been appointed controller, succeeding George W. Booth, deceased. Mr. Leary was born on September 17, 1858, at Ithaca, N. Y., and graduated from Cornell University in 1880. He began railway work in June, 1882, as a clerk in the mechanical department of the Pennsylvania Company at Fort Wayne, Ind. In May, 1883, he was promoted to chief clerk in the office of the superintendent of motive power of the same company, remaining in that position until November, 1899, when he was made chief clerk to the general superintendent of motive power of the Pennsylvania Lines West of Pittsburgh, with headquarters at Pittsburgh, Pa. He went to the Baltimore & Ohio in June, 1901, as assistant to the general manager, and in April, 1902, was made general auditor, which position he held at the time of his recent appointment as controller of the same road as above noted.



J. T. Leary

Operating

D. S. Kamerer, chief clerk to the general manager of the Ohio division of the Erie at Cleveland, Ohio, has been appointed assistant general manager of the Chicago Terminal division, with headquarters at Chicago.

F. A. Brainerd has been appointed superintendent of the Vancouver division of the Spokane, Portland & Seattle, and of the Oregon Trunk, with headquarters at Vancouver, Wash., vice J. P. Rogers, resigned; effective February 22.

Clinton A. Morgan, who has been appointed superintendent of the Pennsylvania division of the Delaware & Hudson with headquarters at Carbondale, Pa., as has been announced in these columns, was born on March 18, 1874, at Stockwell, N. Y., and was educated in the common schools. He began railway work in August, 1888, as a telegraph operator on the Delaware, Lackawanna & Western. The following year he became copy operator on the Erie and in May, 1893, entered the service of the Delaware & Hudson as copy operator at Carbondale, Pa., and since that time has been in the service of that road at the same place. In February, 1900, he was appointed train despatcher and three years later was made assistant chief despatcher, becoming chief despatcher in February, 1907. He was appointed assistant trainmaster in November of the same year and was promoted to trainmaster in February, 1911, which position he held until January, 1914, when he was made acting superintendent of the Pennsylvania division, and now becomes superintendent of the same division.

Morton Riddle, whose appointment as general manager of the Florida East Coast, with headquarters at St. Augustine, Fla., has been announced in these columns, was born on August 10, 1869, at Petersburg, Va., and was educated in the public schools. He began railway work on April 1, 1887, and was consecutively rodman, instrument man and resident engineer on the Clinch Valley division of the Norfolk & Western and on the Charleston, Cincinnati & Chicago, now a part of the Carolina, Clinchfield & Ohio, until May, 1890. He entered the service of the Atlantic Coast Line the following year as roadmaster, and in November, 1901, was appointed superintendent of the Richmond district. From June, 1904, to January, 1905, he was assistant chief engineer of the same road at Savannah, Ga. He was promoted to general superintendent of the Second division at Savannah in 1905, and in February, 1907, became general superintendent of the Third division at Jacksonville, Fla., which position he held at the time of his recent appointment to the position of general manager of the Florida East Coast as above noted.

Traffic

V. J. Kaiser has been appointed commercial freight agent of the Missouri Pacific, St. Louis, Iron Mountain & Southern, Denver & Rio Grande and Western Pacific, at Sedalia, Mo., in place of W. B. Shirk, who has been appointed general live stock agent of the Missouri Pacific and St. Louis, Iron Mountain & Southern at Kansas City, Mo., succeeding F. C, Fletcher, resigned to accept service elsewhere.

Guy S. McCabe, who recently was appointed general freight agent of the Pennsylvania Company at Pittsburgh, Pa., as mentioned in our issue of February 20, was born July 23, 1873, at Sewickley, Pa. He entered railway service November 1, 1889, and for five years was clerk in the general freight office of the Pittsburgh, Cincinnati & St. Louis and the Chicago, St. Louis & Pittsburgh, afterward consolidated as the Pittsburgh, Cincinnati, Chicago & St. Louis at Columbus, Ohio. He was then for two years clerk in the division freight office at Richmond, Ind., and from November, 1896, to March, 1903, was traveling freight agent at the same place. The following five years he was division freight agent of the same road at Richmond, in charge of the north end of the Richmond division, east end of the Logansport division, and the Effner branch. Mr. McCabe was then until June, 1910, general western and division freight agent of the same road at Chicago, having in charge the Chicago terminal division and the west end of the Logansport division. On the latter date he was made general western and division freight agent of the Pennsylvania Company, in charge of the Chicago Terminal division, from which position he is now promoted to that of general freight agent of the Pennsylvania Company, with offices at Pittsburgh, as above noted.

G. S. McCabe

Engineering and Rolling Stock

F. W. Leatherby has been appointed division engineer of the Gulf, Colorado & Santa Fe at Temple, Tex., to succeed F. D. Griffin, who resigns to take charge of the construction of the new union terminal at Dallas.

S. M. Bate, formerly division engineer of the New Orleans, Texas & Mexico and the Beaumont, Sour Lake & Western, at DeQuincy, La., has been appointed division engineer of the Missouri Pacific at St. Louis, Mo.

Joseph Emanuel Crawford, whose appointment as chief engineer of the Norfolk & Western, with headquarters at Roanoke, Va., has already been announced in these columns, was born on December 1, 1876, at San Diego, Cal., and was educated at the University of Pennsylvania. From 1895, to 1903, he was first draftsman and later designer at the Pencoyd Iron Works, and in July of the latter year, entered the service of the Norfolk & Western as acting bridge engineer. He was subsequently made bridge engineer, and in May, 1913, was appointed acting chief engineer, which position he held until his recent appointment as chief engineer of the same road as above noted.

John Dickson, whose appointment as general master mechanic of the Spokane, Portland & Seattle, the Oregon Trunk, Oregon Electric and United Railways, with headquarters at Portland, Ore., has already been announced in these columns, began railway work as machinist apprentice with the Great Northern. He was subsequently until 1899 machinist, air brake man and draftsman, leaving that road to become instructor in the Mechanic Arts High School at St. Paul, Minn. He remained in that position for two years, returning to the Great Northern as general air brake instructor, and was successively superintendent of shops at Everett, Wash., and master mechanic of the Dakota division. He has been with the Spokane, Portland & Seattle as master mechanic since it was first put in operation, and on February 1 was made general master mechanic, as above noted.

H. J. Small, who retires as general superintendent of motive power and machinery of the Southern Pacific, as has been mentioned in these columns, has been in railway service since 1868, when he commenced as a machinist for the Chicago & North Western at Chicago. He was from 1869 to 1874 successively draftsman for the Kansas Pacific, the Northern Pacific and the Toledo, Wabash & Western. The succeeding three years he was general foreman of the International & Great Northern, and from 1877 to 1879 was master mechanic of the Galveston, Houston & Henderson. He was then for two years master mechanic of the Texas & Pacific, returning to the Northern Pacific in 1881 as assistant superintendent of machinery, where he remained until 1886. From 1887 to 1888 Mr. Small was assistant superintendent of motive power of the Philadelphia & Reading, and he then went to the Southern Pacific as superintendent of motive power and machinery. On July 1, 1902, he was made general superintendent of motive power and machinery, with headquarters at San Francisco, Cal., from which position he now retires.

Purchasing

H. L. Richardson has resigned as fuel agent of the St. Louis, Brownsville & Mexico at Houston, Tex., and the office has been abolished.

OBITUARY

A. B. Adams, division master mechanic of the Gulf, Colorado & Santa Fe at Silsbee, Tex., died suddenly on February 16, aged 49 years.

Edwin Milner, who was a director of the New York, New Haven & Hartford from 1902 until his resignation on January 15 of this year, on account of ill health, died at his home in Moosup, Conn., on February 19, at the age of 71.

Elhanan Zook, formerly superintendent of construction of the Panama Railroad, until January 4, 1914, died at Philadelphia on January 26. He had been a roadmaster and trainmaster on the Chicago, Burlington & Quincy, and entered the service of the Isthmian Canal Commission in 1905 as assistant engineer. He was later supervisor, roadmaster, engineer of maintenance, and from June 15, 1913, to January 4, 1914, superintendent of construction.

John P. Hess, junior assistant superintendent of the relief department of the Baltimore & Ohio at Baltimore, Md., died in that city on February 20. He was born on July 7, 1849, at Uvilla, W. Va., and entered the service of the Baltimore & Ohio on September 7, 1882, as a clerk in the relief department. Six years later, he was made acting chief clerk, becoming chief clerk of the relief department on April 1, 1889, and since May 1, 1909, he was junior assistant superintendent of the same department.

Equipment and Supplies

LOCOMOTIVE BUILDING

THE TEXAS & PACIFIC is in the market for 20 locomotives.

THE DENVER & RIO GRANDE is in the market for 10 locomotives.

THE PITTSBURGH & LAKE ERIE is in the market for 2 Mallet type locomotives.

THE WESTERN MARYLAND is in the market for 20 consolidation type locomotives.

THE CHICAGO & EASTERN ILLINOIS is in the market for mikado and Pacific type locomotives.

THE CENTRAL OF BRAZIL is in the market for 20 Pacific type and 30 Mallet type locomotives.

THE ST. LOUIS, BROWNSVILLE & MEXICO is in the market for 16 or 18 consolidation type locomotives.

THE PEKIN KALGAN has ordered 2 consolidation type locomotives from the American Locomotive Company.

THE CONWAY LUMBER COMPANY, Conway, S. C., has ordered one prairie type locomotive from the Baldwin Locomotive Works.

THE JOHN L. ROPER LUMBER COMPANY, Norfolk, Va., has ordered one prairie type locomotive from the Baldwin Locomotive Works.

THE DILL-CRAMER-TRUITT CORPORATION, Suffolk, Va., has ordered one prairie type locomotive from the Baldwin Locomotive Works.

THE CHESAPEAKE & OHIO has ordered 6 Pacific type and 6 mikado type locomotives from the American Locomotive Company. The latter are to be used by the Hocking Valley.

THE LEHIGH VALLEY COAL COMPANY, New York, has ordered one six-wheel saddle-tank switching locomotive from the Davenport Locomotive Works for use at the company's colliery at Lost Creek, Pa.

THE BULGARIAN GOVERNMENT is inquiring for 50 passenger and freight locomotives. Further particulars may be obtained from the office of the Bureau of Foreign and Domestic Commerce, 315 Custom House, New York.

THE BUFFALO CREEK has ordered 3 eight-wheel superheater switching locomotives from the American Locomotive Company. These locomotives will have 22 x 28 in. cylinders, 51 in. driving wheels, and a total weight in working order of 212,000 lb.

THE VERDE TUNNEL & SMELTER RAILROAD has ordered 2 six-wheel superheater switching locomotives from the American Locomotive Company. These locomotives will have 21 x 26 in. cylinders, 50 in. driving wheels, and a total weight in working order of 158,000 lb.

THE CHILI EXPLORATION COMPANY has ordered 2 consolidation type locomotives from the American Locomotive Company. These locomotives will have 22 x 30 in. cylinders, 56 in. driving wheels, a total weight in working order of 202,000 lb. and a steam pressure of 200 lb.

THE HARBOR COMMISSIONERS OF QUEBEC have ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 19 x 26 in. cylinders, 50 in. driving wheels, a total weight in working order of 123,000 lb. and a steam pressure of 175 lb.

THE NEVADA NORTHERN has ordered one superheater consolidation type locomotive from the American Locomotive Company. This locomotive will have 21 x 30 in. cylinders and 51 in. driving wheels, a total weight in working order of 200,000 lb., and a steam pressure of 190 lb.

THE SOUTHERN has ordered 17 mikado and 10 Pacific type locomotives from the American Locomotive Company. This

road was in the market for 15 mikado, 5 Pacific, 6 ten-wheel, 13 six-wheel switching and 2 eight-wheel switching locomotives. The order for the switching locomotives has been deferred.

The Cuba Railroad has ordered 2 superheater ten-wheel passenger and 6 ten-wheel freight locomotives from the American Locomotive Company. The former will have 21 x 26 in. cylinders and a total weight in working order of 149,000 lb. The latter will have 18 x 24 in. cylinders, 52 in. driving wheels and a total weight in working order of 120,000 lb.

CAR BUILDING

The St. Louis Southwestern is in the market for from 1,000 to 2,000 cars.

The Butte, Anaconda & Pacific has ordered 150 ore cars from the Pressed Steel Car Company.

The Texas & Pacific is in the market for 100 steel passenger cars, 500 box cars and 1,000 gondolas.

The Florida East Coast has ordered 500 box cars from the Mount Vernon Car Manufacturing Company.

The St. Louis, Brownsville & Mexico is in the market for about 15 passenger train cars and several hundred freight cars.

The Illinois Central, as recently announced in these columns, has ordered 1,000 steel gondola cars from the American Car & Foundry Company. These cars will be of 50-ton capacity, will weigh 39,300 lb., and the inside measurements will be 40 ft. long by 9 ft. 6 in. wide and 4 ft. 7 in. high. The overall measurements will be 44 ft. 9 in. long by 10 ft. 1¼ in. high and 8 ft. 9 13/16 in. high.

New York Municipal Railway.—The New York Public Service Commission for the First district has approved a contract made by this company with the American Car & Foundry Company for 100 steel subway cars. These cars are to be 67 ft. long and 10 ft. wide. The motors will be supplied by the General Electric Company and the control apparatus and air brake equipment by the Westinghouse companies. Deliveries are to begin in August and be completed by December 1.

IRON AND STEEL

The Illinois Central has ordered 17,500 tons of rails from the Tennessee Coal, Iron & Railroad Company.

The Chicago Surface Lines have ordered 20,000 tons of 129-lb. girder rails from the Lorain Steel Company.

The St. Louis & San Francisco has ordered 6,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

American Locomotives for Australia.—The government of the commonwealth of Australia has recently placed an order for four locomotives for the Transcontinental Railway, now under construction, with the Baldwin Locomotive Works. Such action caused serious debate in the Federal Parliament. The Assistant Minister of Home Affairs has therefore issued the following statement: Every manufacturer of engines in Australia was approached, to ascertain if they could be supplied in Australia. Without exception, the firms replied that they could not give speedy delivery. He then decided to invite quotations for quick supply from over-sea firms. The Baldwin Company of America, made the most satisfactory offer. The price of the Clyde Engineering Company for engines of this type was $30,148, but these American engines were costing $23,573 at Port Augusta, or $25,305 at Kalgoorlie; the question of price, however, did not enter into the case. The need for speedy delivery is that for every 50 miles of track laid an engine is required, and the tracklayers are putting down 1½ miles a day, so that a locomotive is required at each end of the railway every 2½ months. Inquiries were made of over-sea firms doing business in Australia, and the representatives of Baldwin's offered to ship the engines from the United States in 15 weeks. British and Scottish firms wanted 11 or 12 months.

Supply Trade News

Edward W. Hodgkins has resigned his connection with Guilford S. Wood, Chicago, to engage in business for himself.

The Great Northern has contracted with the Edgar Steel Seal & Manufacturing Company, Chicago, for its car seal supply for the coming five years.

I. W. Lincoln has been appointed vice-president of the Duncan Lumber Company, of Portland, Ore., and is now in charge of the eastern sales office recently opened in the McCormick building, Chicago.

The Northern Insulating Company, St. Paul, Minn., has received orders for Flaxlinum insulation for 150 Illinois Central refrigerator cars and 50 dining cars for the Atchison, Topeka & Santa Fe.

W. K. Allen, formerly secretary of the Elgin, Joliet & Eastern, has become general western agent of the Hudson Mechanical Rubber Company, 50 Church street, New York, and the United Railway Signal Company, Trenton, N. J. His office is in the People's Gas building, Chicago.

The Roberts & Schaefer Company, Chicago, has been awarded a contract by the Bessemer & Lake Erie for the building of a 400-ton capacity reinforced concrete locomotive coaling station, using the Holmen type bucket, for installation at Branchton, Pa. The contract price is approximately $25,000.

H. E. Gifford, general sales manager of the National Electric Specialty Company, has recently been appointed sales agent for the Handy die stock and the Becker receding pipe threader. Mr. Gifford will be the exclusive representative for these products in the field offered by the railroads, street railways, city police and fire departments, and hydro-electric and power companies.

At the recent annual meeting of the Modern Steel Structural Company, Waukesha, Wis., C. J. McIntosh was elected president, and J. T. Cheney, vice-president, succeeding S. B. Harding and F. W. Harding, who have sold their interest in the company. G. W. Helmer was elected secretary; R. A. Raschig, treasurer, and G. A. Haynes, chief engineer. The company will open a Chicago office.

The White Enamel Refrigerator Company, St. Paul, Minn., has received orders within the past few weeks for the following refrigerator car devices: Bohn all-steel collapsible bulkheads for 150 Illinois Central express refrigerator cars; Bohn tanks for 40 Northern Pacific express refrigerator cars; 10 Chicago & Alton cars; 50 Intercolonial cars, and 100 Louisville & Nashville refrigerator cars.

Bertram Smith has been appointed assistant manager of the Edison Storage Battery Supply Company, San Francisco, which handles the Edison battery on the Pacific coast. Mr. Smith started in the storage battery business in 1899 with the National Battery Company, Buffalo, N. Y. He was secretary and treasurer of that company for three years, but since its absorption by the United States Light & Heating Company, Chicago, he has been manager of the latter company's battery department.

W. F. Bauer has resigned from the United States Light & Heat Company, to become assistant manager of the railway department of the Edison Storage Battery Company, Orange, N. J. Mr. Bauer was with the Pullman Company and the Wagner Palace Car Company in the earlier days of electric car lighting. From 1903 to 1905 he was chief electrician of the Missouri Pacific. He then left to become sales manager of the Electric Storage Battery Company, Chicago. In 1907 he took a similar position with the National Battery Company. When this company was absorbed by the United States Light & Heating Company he became manager of the latter's railway department at Chicago. Mr. Bauer in his new position will have immediate supervision over the sales of the railway department of the Edison Storage Battery Company in the west and southwest, and will have headquarters at 2025 Michigan avenue, Chicago.

Railway Construction

BIG HORN CANYON IRRIGATION & POWER COMPANY.—An officer writes that a contract will be let about July 1, to build 68 miles of railway from the mouth of Big Horn canyon, Mont., north via St. Xavier and Hardin to Custer on the Northern Pacific. There will be one steel bridge over the Big Horn river, about 600 ft. long. The company also plans to put up a dam 200 ft. high. The principal commodities to be carried on the line will be farm products, live stock and coal. John J. Harris, president; Edward Lawlor, secretary, and A. W. F. Koch, chief engineer, Hardin, Mont.

BIRMINGHAM, ENSLEY & BESSEMER (Electric).—An officer is quoted as saying that financial arrangements have been made and construction work will be resumed on an extension from Fairfield, Ala., to Bessemer. About eight miles of line remain to be built on the extension. (December 19, p. 1207.)

CANADIAN ROADS.—A contract has been given to the Northern Construction Company, Winnipeg, Man., for building the 85 miles of railway for the Greater Winnipeg Water District between a point on the Grand Trunk Pacific and Indian Bay. S. H. Reynolds is chairman of commissioners, Winnipeg. (February 6, p. 296.)

CHICAGO, BURLINGTON & QUINCY.—An officer writes regarding the building of a cut-off from Omaha, Neb., to the Ashland-Sioux City line, that such a line has not yet been definitely decided upon, but one or two lines are being considered on which work will be started in 1914 to be used as a cut-off between Omaha and the Ashland-Sioux City line. No contract has yet been let for the work. (October 24, p. 805.)

FRONTIER TERMINAL.—See Frontier & Western.

FRONTIER & WESTERN.—The New York Public Service Commission, Second district, has granted a certificate of public convenience and necessity to this company, which was incorporated several years ago and had been unable to secure a certificate up to the present time. The plans call for building from the International bridge, N. Y., to Tonawanda, where a connection will be made with the Frontier Terminal, a projected freight belt line around Buffalo from West Seneca on Lake Erie to Tonawanda. C. W. Goodyear was president and R. F. Schelling, secretary, at the time the company was incorporated, and Ricker & Minniss are the engineers, all of Buffalo.

HIGH RIVER, SASKATCHEWAN & HUDSON BAY.—Application has been made to the Canadian parliament to amend the act of incorporation of 1912, changing the place of commencement of the authorized line from any of the townships 25 to 29, range 1 west of the fourth meridian, to any of the townships 17 to 29, range 1 west of the fourth meridian, Alberta, and thence northeasterly to Saskatoon, Sask.; also from the latter point northeasterly to a point in or near townships 52 to 56, on the easterly boundary of Saskatchewan, then northeasterly to Pas, Man. An extension of time of two years for the commencement, and of five years for the completion of the line, is also being asked. H. N. Sheppard, F. Crandell, T. E. LeClaire, C. A. Gigot and G. D. Stanley, High River, Alta., are interested in the project, and Ballachey & Mackenzie, High River, Alta., are solicitors for applicants.

MARYVILLE-KNOXVILLE.—R. B. Oliver, Maryville, Tenn., who has the contract to build this line from Maryville north to Knoxville, 16 miles, has given a sub-contract to Hickey & Son, Knoxville, it is said, to build the first section. M. L. Butler, president, Chicago; J. F. Shea, vice-president, Knoxville; J. F. Clark, secretary, and K. Burger, treasurer, both of Maryville. (January 16, p. 149.)

MINNEAPOLIS MILLE LACS & NORTHERN.—Organized to build from Anoka, Minn., north to Ogilvie, about 50 miles. A. A. Kranhold, Minneapolis, is said to be interested.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has awarded the contract for the reconstruction of the Steinway tunnel to the Rapid Transit Subway Construction Co. for $383.910. This tunnel is already completed as a two-track line from a point between Lexington and Third avenues, in the borough of Manhattan, to Jackson and Van Alst avenues, Long Island City. Bids for the construction of Section No. 6-A, of routes Nos. 4 and 38, the Seventh avenue subway in the borough of Manhattan, will be opened on March 12. This section will connect the new Seventh avenue subway from a point 100 ft. south of Forty-third street with the existing line north of Times square. The contract for building Section No. 2 of the Lutheran Cemetery line, in the borough of Brooklyn, will be given to F. W. Burnham, the lowest bidder, for $143,225.

NORTHERN TERRITORIAL.—Application is being made in Canada for an extension of time to build from Fort Churchill or Port Nelson, on Hudson bay, westerly via a point north of Lake Wollaston, Sask., thence to Lake Athanaska, Alta., and north of the Peace River block, thence southwesterly through the Rocky mountains to the Pacific coast at or near Port Essington, or near the Portland canal; from a point on the above line near the crossing of the Athabaska river southerly to McMurray, Alta., thence southerly via Lac la Biche to Edmonton, Alta. H. Fisher, Ottawa, Ont., is solicitor for applicants.

OREGON SHORT LINE.—An officer writes regarding the report that an extension of the Twin Falls line from Rogerson, Idaho, south to Valley Pass, Nev., about 85 miles, is to be built, that no authority has yet been given for this extension.

RAINY RIVER RADIAL.—An extension of time to build this line is being asked for in Canada. The authorized lines are as follows: From the Minnesota boundary at Fort Frances, Ont., to the Lake of the Woods at the mouth of the Big Grassy river; from a point on that line west of the township of Mather to the Lake of the Woods at the mouth of the Little Grassy river; from a point on the first named line in the township of Mather to the boundary of Minnesota near the Long Sault rapids on Rainy river, also to the town of Rainy River or to the Minnesota boundary. Lewis & Smellie, Ottawa, Ont., are solicitors for applicants.

WILLAMETTE VALLEY SOUTHERN.—An officer writes that this company is building with its own forces from Oregon City, Ore., south via Beavercreek, Mulino, Liberal, Molalla, Yoder and Monitor to Mt. Angel, 32 miles, and track has been laid on 6.75 miles. There remains about 13 miles yet to be graded and the company expects to have the track laying completed to Mt. Angel by December, 1914. The grading work involves handling from 5,000 to 8,000 cu. yds. to the mile; of this about 85 per cent. is earth work and 15 per cent. loose rock. The line will have maximum grades of 2 per cent. and maximum curvature of 15 degrees. Freight is now being carried over the completed line from Oregon City to Beavercreek and passenger service will probably be started during the early summer. The line will reach the eastern section of Willamette valley, which is about 50 per cent. under cultivation, and the company expects to develop a traffic in cordwood, logs, lumber and farm products. Plans are made to electrify the line within eighteen months. Frank Busch, president, and J. L. Stacer, chief engineer, Oregon City.

RAILWAY STRUCTURES

CARTHAGE, MO.—The Missouri Pacific has prepared plans for a new brick passenger station, to cost about $25,000, on which work is to be started soon.

DALLAS, TEX.—James Stewart & Co., of New York, has been awarded the contract for building the new union station by the Dallas Union Terminal Company. The company has sold $2,000,000 of bonds to defray the cost of the first part of the work.

IRON MOUNTAIN, MICH.—The Chicago, Milwaukee & St. Paul is planning the construction of a new passenger station at this point and a roundhouse and coaling station.

PHILADELPHIA, PA.—As a part of the plan of improvements which the Pennsylvania Railroad is providing in and around Philadelphia, the reconstruction of the North Philadelphia passenger station has been authorized. This is in addition to work previously authorized at that place, and now nearing completion. The improvements at North Philadelphia include the rebuilding of the basement and present train floor of the station.

Railway Financial News

Atlantic Coast Line.—At a meeting of the stockholders of the Atlantic Coast Line Company of Connecticut it was unanimously voted to reduce the capital stock from $17,640,000 to $8,820,000, and to distribute to stockholders half of the company's holdings of common stock of the Atlantic Coast Line Railroad.

Boston & Maine.—A press despatch from Boston says that the trustees whose names were submitted by Governor Walsh, of Massachusetts, to Attorney General McReynolds to manage the New York, New Haven & Hartford's Boston & Maine stock, are Marcus P. Knowlton, of Springfield, Mass.; E. H. Fitzhugh, of New Haven; James L. Richards, of Boston; Charles P. Hall, of Newton, and James L. Doherty, of Springfield. It is said that all of these names are not satisfactory to other interests and that there will be some further compromise.

Carolina, Clinchfield & Ohio.—Blair & Company, New York, have bought from the company and are offering to the public $5,000,000 Carolina, Clinchfield & Ohio Elkhorn extension first mortgage 5 per cent. notes, due May 1, 1917. The offering price to the public is 98½, yielding 5½ per cent. interest on the investment. The notes are secured by a mortgage, through direct or collateral lien, on the 35-mile extension from Dante, Va., the present northern terminus of the C. C. & O., to Elkhorn City, where a connection with the Big Sandy branch of the Chesapeake & Ohio is made. The Carolina, Clinchfield & Ohio earned in the six months ended December 31, 1913, $1,675,146, and during this period had expenses and taxes amounting to $692,677 and, after the payment of fixed charges a surplus for the half year of $510,211.

Denver & Salt Lake.—By a referendum vote, the electors of Denver, Col., have authorized the city council to pass an ordinance for the immediate issue of $3,000,000 4½ per cent. bonds [presumably guaranteed by the city] to provide funds for the construction of the tunnel through the continental divide.

Lake Shore & Michigan Southern.—White, Weld & Company, New York, are offering the unsold portion of $4,350,000 Cleveland Short Line first mortgage 4½ per cent. bonds of 1911-1961, guaranteed principal and interest by the Lake Shore & Michigan Southern at 97¼, yielding about 4.63 per cent. interest on the investment. These bonds are secured by a first mortgage on the new double track belt line through the city of Cleveland, Ohio. The cost of this line, which is 19.64 miles long, was $13,201,531.

New York Central & Hudson River.—This company has paid the New York state registry tax on its proposed issue of $167,102,400 4 per cent. mortgage bonds. On February 18 A. H. Harris, vice-president and general counsel of the New York Central & Hudson River, appeared before Commissioner Clements to explain the plan under which these bonds are to be issued.

Southern Railway.—J. P. Morgan & Co., New York, have bought from the company $10,000,000 5 per cent. 3-year notes secured by $16,666,000 4 per cent. development and general mortgage bonds. In regard to this issue President Harrison gave out a statement which says in part:

"The particular improvements now to be undertaken are chiefly additional and enlarged shops, yards and other freight terminals which have been greatly desired and have been earnestly recommended for several years past to facilitate economical operation and to enlarge the opportunity of the company for securing competitive freight traffic as well as for taking care of local business. These improvements will be undertaken at once and pushed to completion as rapidly as possible. In addition to the improvements provided for as above stated, the Southern Railway has also arranged to finance, through a 10-year equipment trust, the acquisition of additional modern rolling stock, largely of steel construction, representing an aggregate cost of more than $5,000,000."

The notes were sold by the bankers to the public at 99¼.

Union Tank Line.—An initial semi-annual dividend of 2½ per cent. has been declared, payable March 25.

Wabash.—Plans for reorganization are tentatively drawn up but not finally agreed on. *The Wall Street Journal* says:

"It is proposed to assess the company's present preferred and common stock $20 per share in order to raise the necessary reorganization cash. This assessment, along with other provisions for issuance of securities will be underwritten by the bankers, and will provide approximately $18,500,000 reorganization cash. About $25,000,000 cash will be needed, but the company expects to secure $2,250,000 cash from its settlement with the Wabash-Pittsburgh Terminal Railway and the balance will be provided by sale of bonds authorized under a new refunding mortgage covering the company's entire property.

"Stock issued against the reorganized company will be all of one class, which will be exchanged for present preferred and common stocks and assessments thereon upon a pro rata basis not yet definitely decided, but which will not improbably be 110 per cent. to 120 per cent. in new stock for present preferred and par for par for the common.

"Wabash first refundng and extension bonds will receive 110 per cent. of par value in new 5 per cent. adjustment income bonds which are expected to receive interest from date of reorganization. The elimination of the present fixed interest charge against the property on the extension 4s, will reduce the fixed charges on the reorganized property to approximately $3,500,000 annually. It is estimated that with recent improvements to the property from proceeds of receivers' certificates, together with new equipment purchased, earnings of the company will show a fair margin of surplus over its fixed charges when benefit of these improvements and the moral effect of discharge from receivership begin to tell."

Railway Construction in Zambesia.—The only railway in Zambesia at the present time is a narrow gage line, eighteen miles long, from Quilimaine to Macuigal. A projected line from the former point to Tete has received government approval, but its construction is hardly likely to be rapid. Work has already been started on the Port Herald-Zambesia extension. This line is to cross the Ziu-Ziu river by a bridge 2,000 ft. long and will reach the Zambesia river at Chindio, a point on Inyangoma island, just above the Shire mouth. If the line is subsequently extended to Beira the bridge across the Zambesia will have to be about one and one-half miles long.

Important East African Railroad Completed.—It is reported from Berlin that the Germans completed their railway across German East Africa to Lake Tanganyika on February 1. This line starts at Dar-es-Salaam to the south of Zanzibar on the Indian ocean and runs westward to Udjiji and then north a few miles to the terminus, Kigoma. It is not quite 777 miles long. By means of it, express trains will be able to reach the coast from the lake in about two days as compared with the slow and tedious journey of 42 days formerly taken by the caravans. The project was started ten years ago when a concession was granted to the East African Railway to build a short line from Dar-es-Salaam to Morogoro. The German Empire guaranteed 3 per cent. interest to the investors, and the section was completed in 1907. The line was then pushed on to Tabora during the term of Herr Dernburg's control of the colonial office. In 1908 the Reichstag transferred the shares in that section from the East African railway to the German East African Administration. Funds were voted for the construction of the last section in 1911, and it is worthy of note that the line has been completed 14 months before the date specified in the contract. It is planned to establish a motor boat or steamship service on Lake Tanganyika from Udjiji, where it is hoped that a considerable freight traffic for the road can be built up from the ports on the lake and from the agricultural regions adjacent to it. There has been some fear that the new line may have a somewhat detrimental effect on the so-called Uganda railway in the adjacent colony of British East Africa. It will certainly have an important influence not only on the development of German East Africa, but also on the economic future of the Belgian Congo and of Central Africa generally. It may be that the English line will suffer for a while, but it does not require a great stretch of the imagination to see that there will ultimately be adequate business for both lines.